November 24, 1958

Paper Trade Journal

First Kamyr Continuous Digester Installation on Bleached Neutral Sulphite Semi-Chem Pulp

Conical and Disk Type Refiners for Stock Preparation Are Discussed and Evaluated

Paperboard Executives Get Optimistic Reports on Present Operations and the Future Outlook

PROFIT IN TODAY'S MARKET...

Current market conditions are often reflected in a mill's profit picture. Top efficiency in both tonnage produced and quality of product is required to insure an operating profit. The search for profit has necessitated mills to re-evaluate their entire operation. And many are finding the answers in a revitalization program.

The Moore & White Company has worked with a number of mills where favorable profit pictures have resulted from the addition of new equipment or the revitalization of certain sections of existing machines. In some cases, higher speeds have been obtained in the machine room by the installation of additional dryer capacity. For others, the answer has been a new drive installation, or increased production through modern, high speed finishing room equipment.

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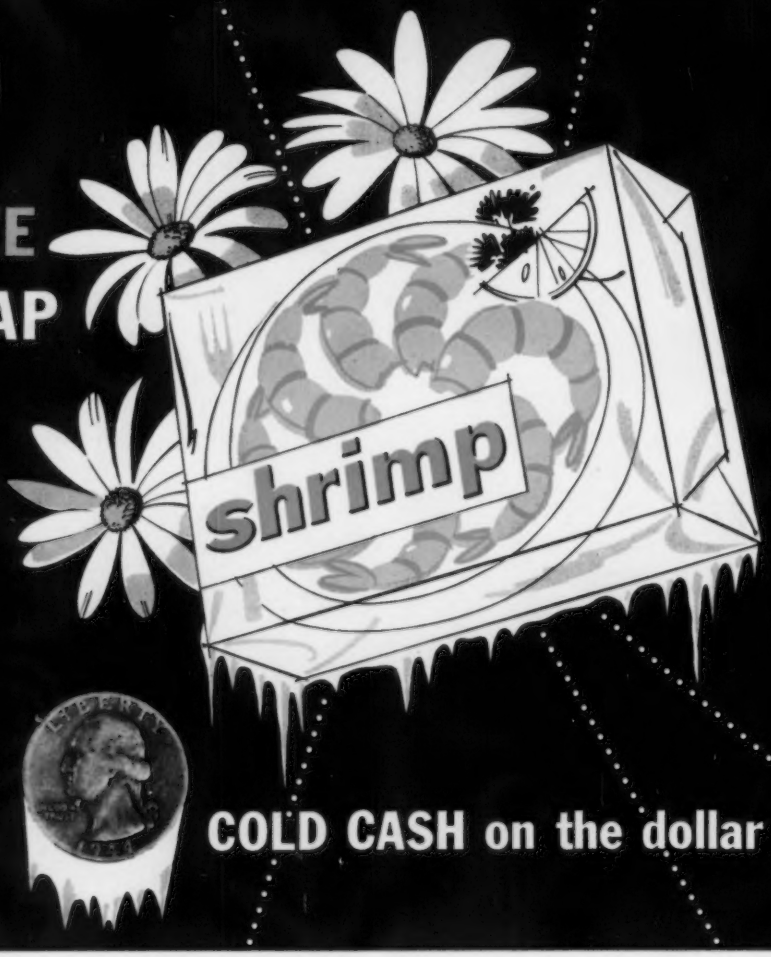

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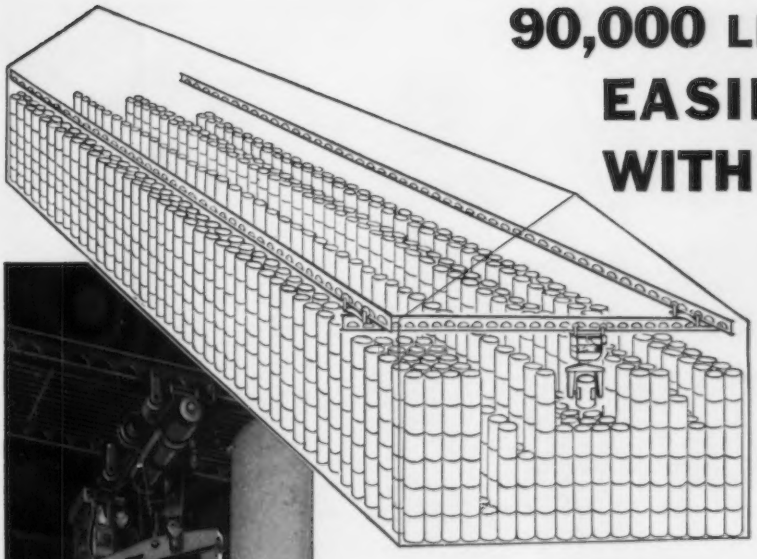

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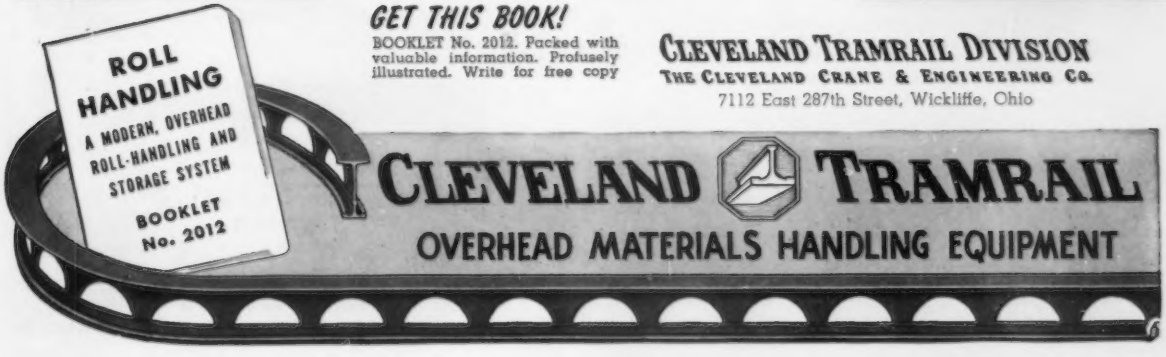

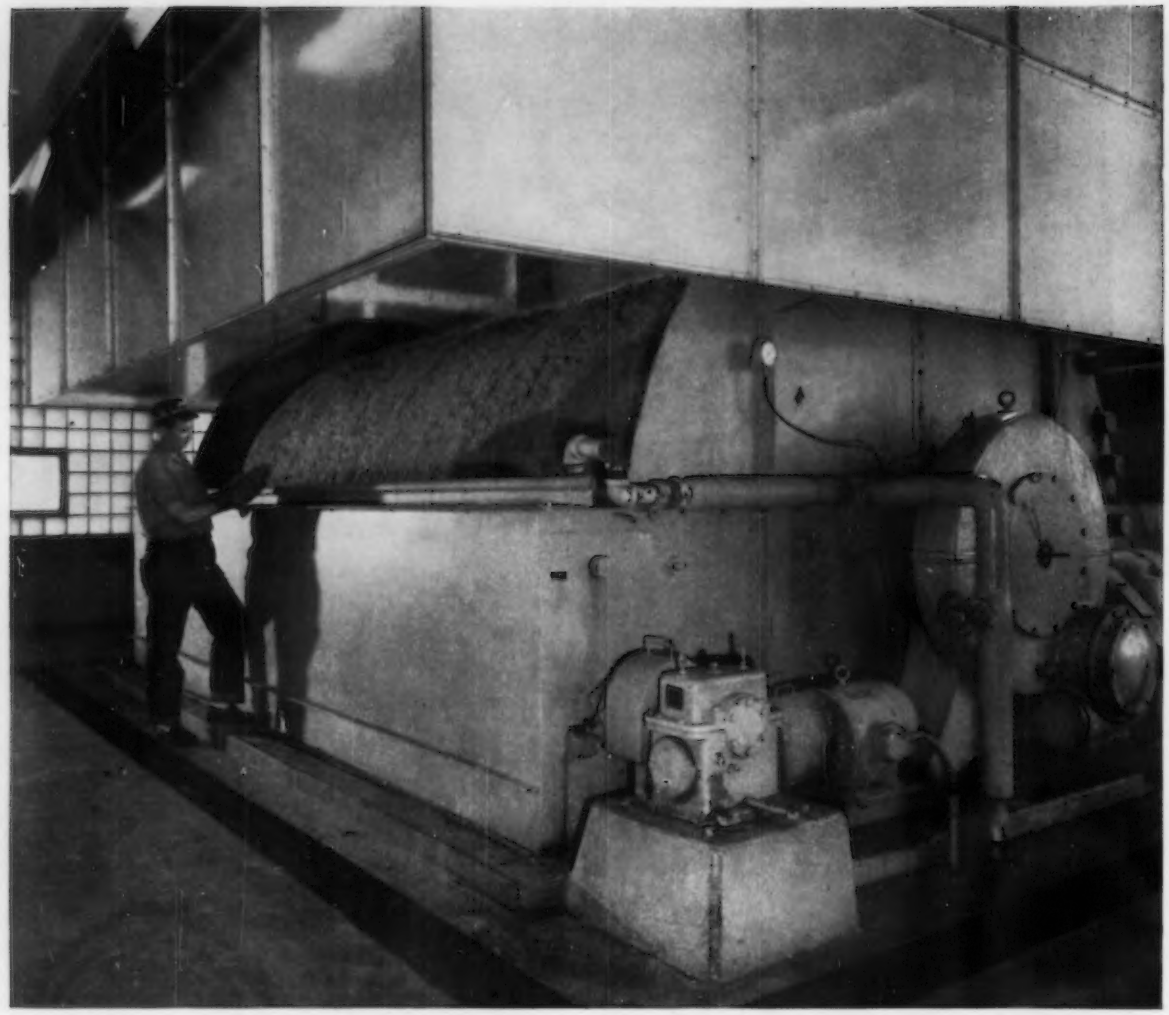

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Paper Trade Journal

PUBLISHED WEEKLY SINCE 1872

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REMEMBER THESE DATES

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Feb. 23-26, 1959: Paper Week in New York

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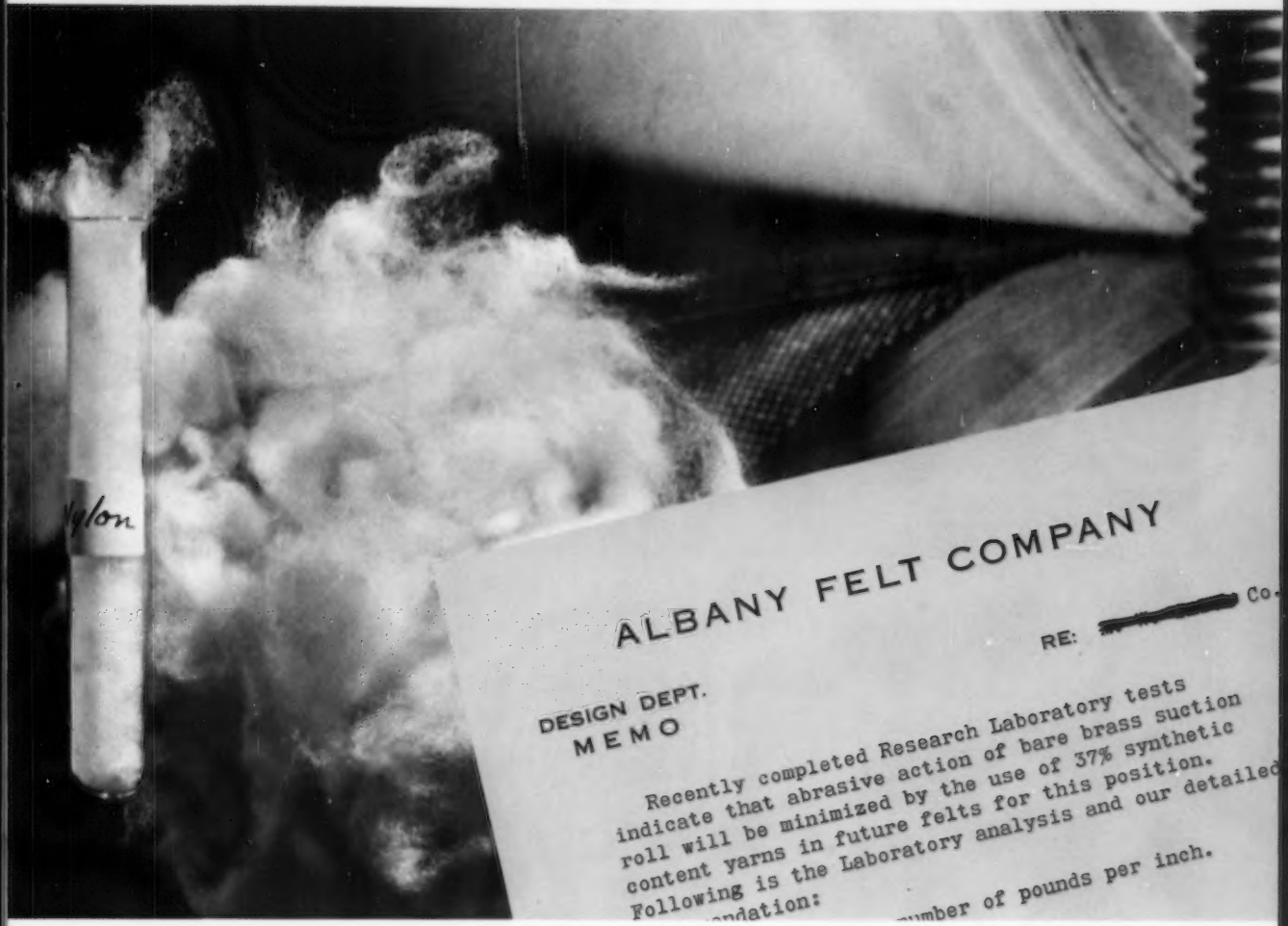
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The continuous starch cooker is still another important reason to turn to Corn Products for your starch needs. Of more basic importance are the starches themselves: a complete assortment of high-grade, quality-controlled starch in such a wide variety that *they can be tailor-made to meet your particular requirements.*

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*name upon request; a reprint describing this installation is also available

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Trends

Upswing Not Moving Quite So Fast

The upswing in the general economy seems to be slowing. This is not to say that business is not improving but rather that the rate of improvement appears to be less than in September and October (The stock market not withstanding). For example automobile and related steel output have not maintained predicted rates. Paper and board production in the first half of November was slightly behind the first two weeks of October.

Business Men's Expectations for First Quarter

Nearly three quarters of the 1,548 business men participating in Dun & Bradstreet's latest compilation of business men's opinions were optimistic about their sales prospects during the first quarter of 1959. With 72% looking forward to year-to-year gains, and only 4% anticipating declines, the average viewpoint was more optimistic than in any such inquiry since that for the fourth quarter of 1955.

New Construction High Forecast for '59

One of the nation's leading building economists predicted today that construction activity in 1959 will hit a new all-time high for the 12th successive year but housing starts (public and private combined) will remain at about the 1958 level of 1,160,000. E. W. Magee, Jr., associate economist of the F. W. Dodge Corp., construction news and marketing service, explained that his forecast was based on recent construction contract awards and the outlook for contract awards next year.

Standard & Poor Looks at Paper

"Demand for coarse papers and containerboard, which initially reflected the business turn-around is likely to experience continued gains" states the Standard & Poor's November Paper Industry Survey. Laggards such as publication grades (including newsprint) and fine papers may be expected to follow as general advertising expenditures advance, predicts this report. Progressively improved earnings for the last half of 1958 are expected to continue growth next year. The report concludes that some divided increases are likely in 1959.

October Folding Box Performance Disappointing

October folding box shipments increased 3.6% from September but this was less than the usual seasonal gain of 5.4%. Shipments in September were 5.1% below the same month last year.

Corrugated Box Prices Moving Up

Rises in the prevailing low prices for corrugated boxes, previously predicted here, are becoming general. These are said to range from 5 to 10%.

This Stainless Steel reducer replaces one that was made from another metal. Notice the cutting, forming, and welding operations that were performed right in Gardner's own pipe shop.

Stainless Steel makes clean paperboard

at Diamond Gardner Corporation, The Gardner Division, Middletown, Ohio

Low pH in the mill water systems at one time corroded the equipment that Gardner used in its paperboard plant. As a result, particles of rust and scale sometimes got into the finished paperboard. This was not satisfactory for the high-quality products made from Gardner board.

This board *has* to be clean and uniform in color for uses such as retail packaging. It was easy to see that something had to be done about the corrosion problem.

Something *was* done. They removed the old equipment and replaced it with Stainless Steel. Stainless was selected because it won't corrode in this kind of work. It keeps its dense, smooth surface and is easily cleaned. And because it doesn't corrode, it lasts years longer.

Today, Gardner makes board that meets the highest demands of the package industry—clean enough to hold food, liquids, and drug products.

When you think about new equipment for your plant, think about Stainless Steel. And if you want service-tested quality, specify USS Stainless Steel. For fast delivery of Stainless Steel, call your local steel distributor.

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Fig. 3003 — Steel Gate Valve for 300 pounds. Outside screw rising stem and bolted flanged yoke. Also available with welding ends. Powell Steel Valves can be supplied for pressures from 150 through 2500 pounds.

Fig. 2192 — Large Ni-resist Swing Check Valve for 200 W. O. G. Permits full unobstructed flow through when disc is in wide open position. Can be used in horizontal or vertical position.

Fig. 1893 — Large O. S. & Y. Gate Valve for pulp and paper mill service. 200 pounds W. O. G. 3½% Nickel-iron body, bonnet, yoke; 18-8S Mo. stem and screwed-in seat rings; Ni-resist guided solid wedge disc.

Small Flush Bottom Tank Valves for 150 W. P. made in two designs: Fig. 2172 disc opens into tank, Fig. 2173 disc opens into valve. Available in a number of metals and alloys; also for 300 and 600 W. P.

Fig. 2600 — New 150-pound Bronze Full Flow Globe Valve. 500 Brinell hardened, stainless seat ring and disc. Nominal pipe size seat opening and extra high lift of disc assure full flow with minimum pressure drop and turbulence. Can be supplied with indicator collar and arm for visual control. 200 and 300 pound valves also available.

Fig. 1559 — Steel Lubricated Plug Valve for 200 pounds W. O. G. — A. S. A. 150 pounds. Screwed gland type. Single gland and bolted gland types can also be furnished. Large valves—6" and above—can be supplied with gears for gear operation.

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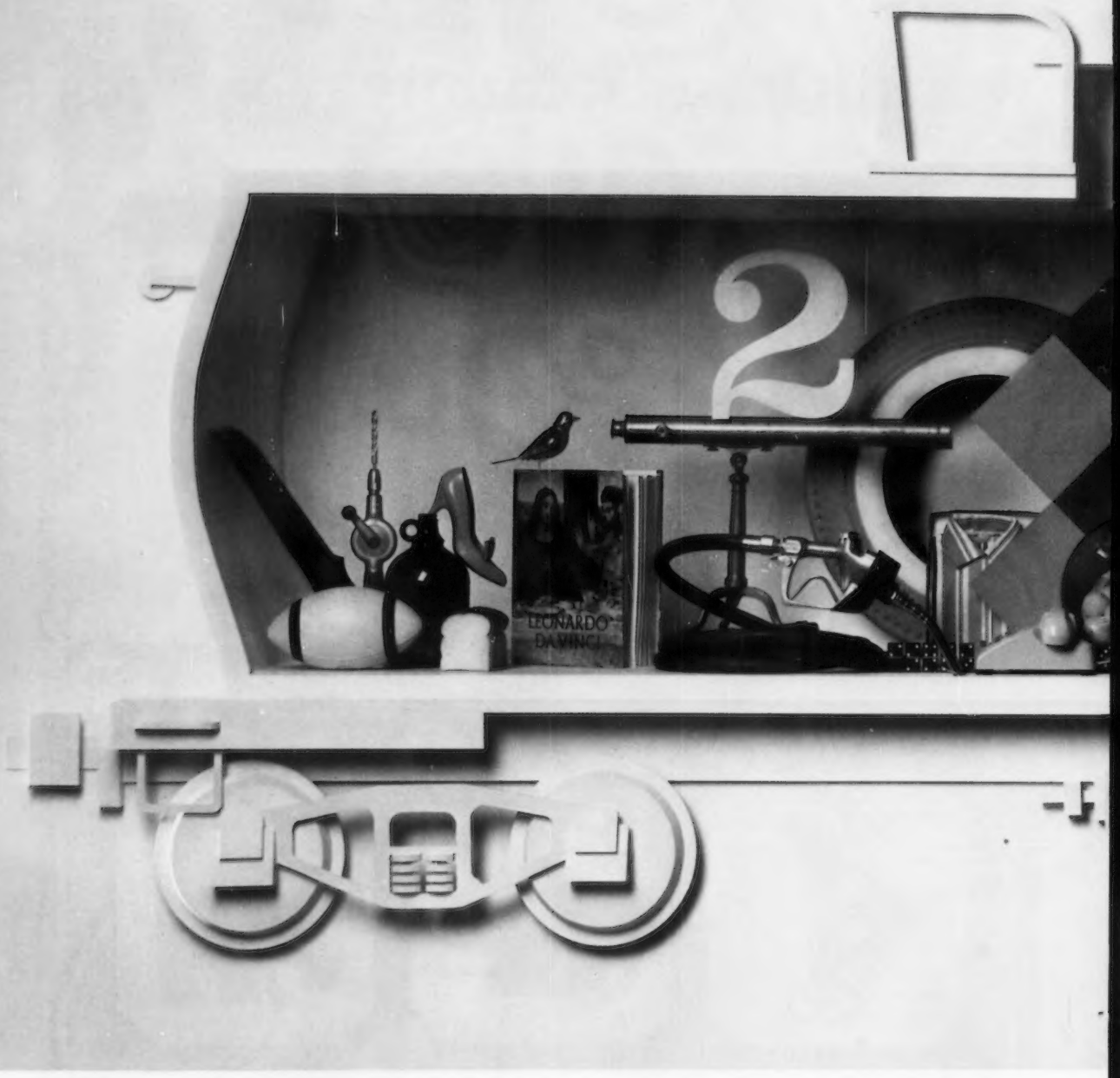

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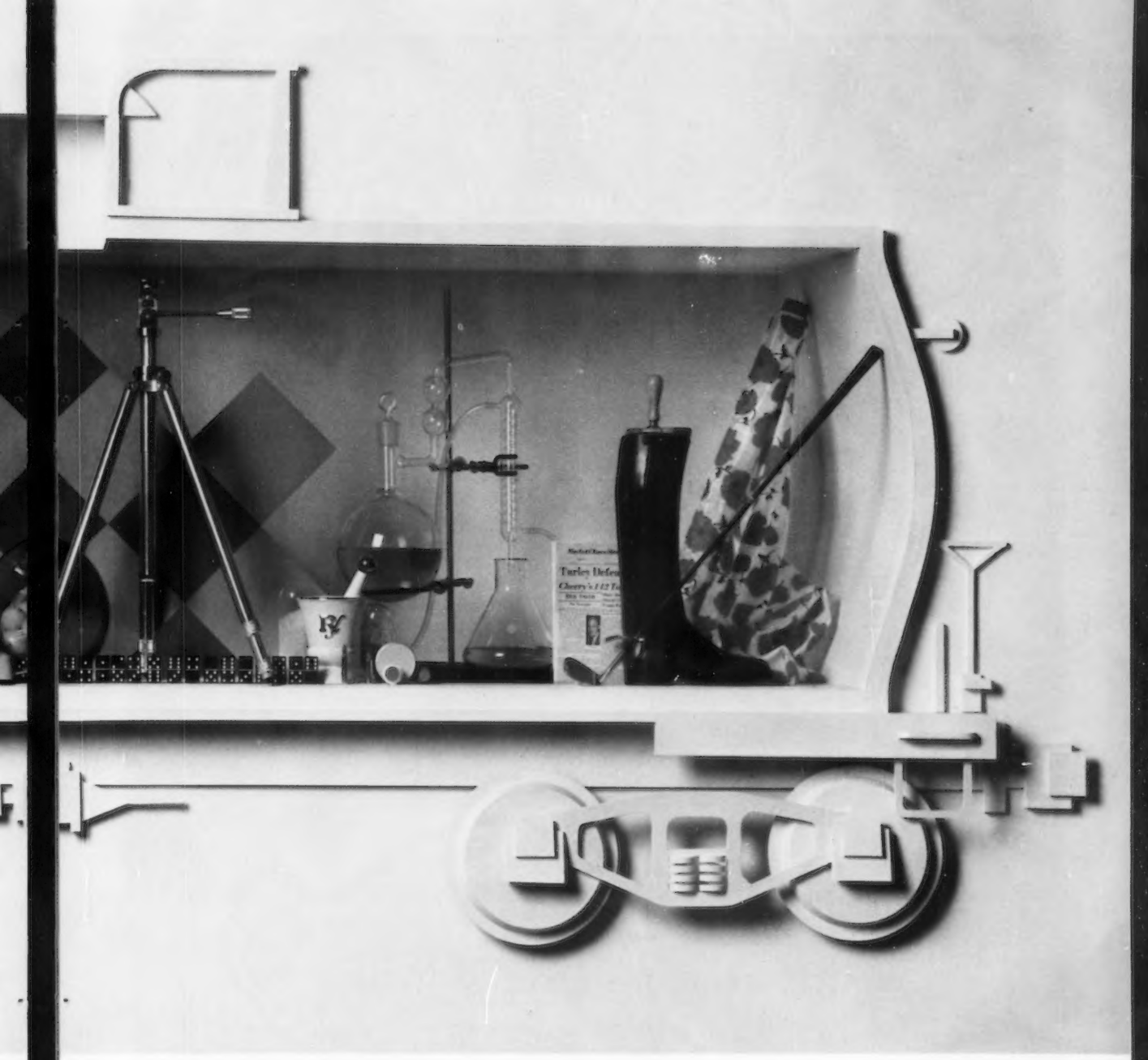

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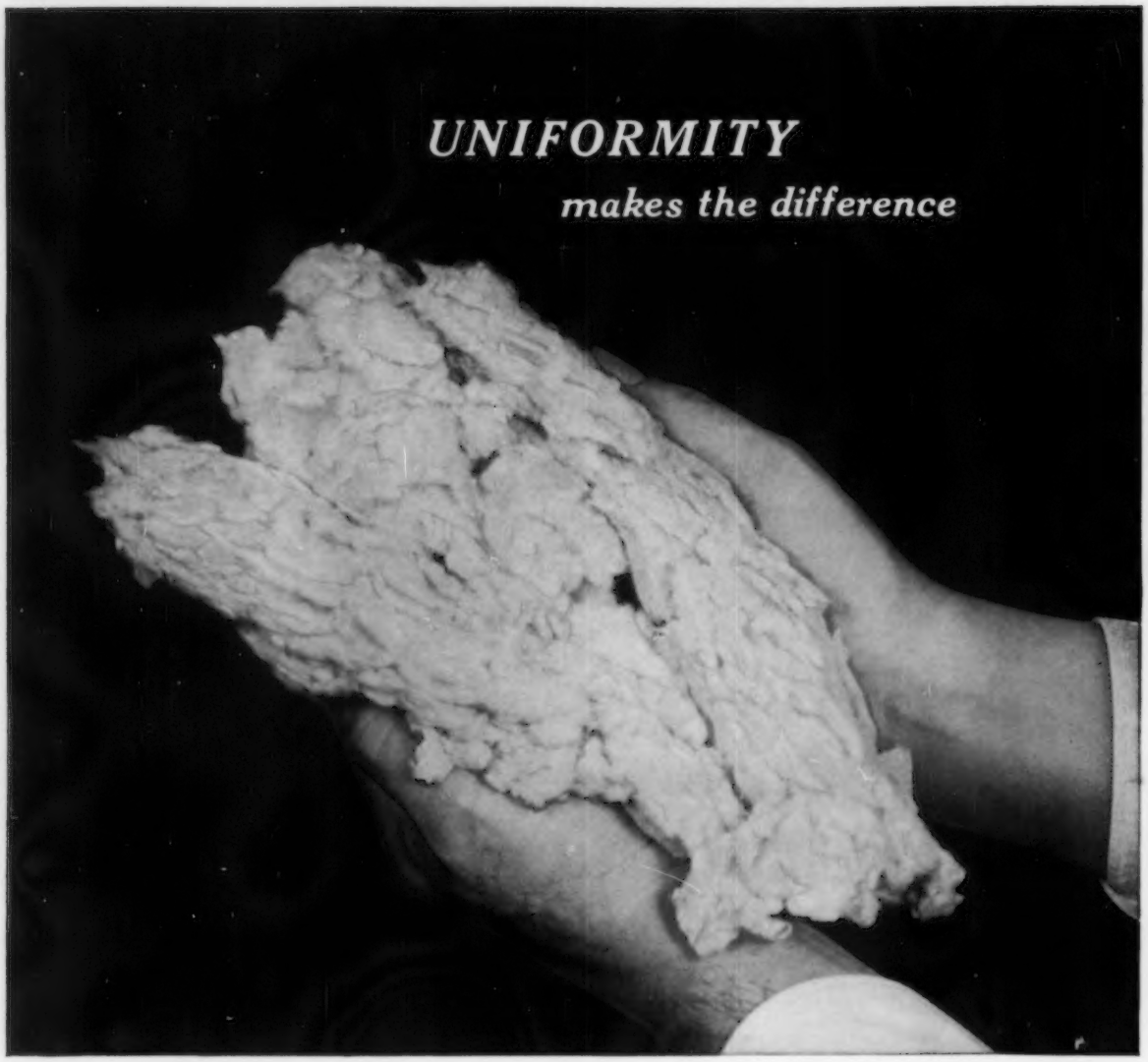

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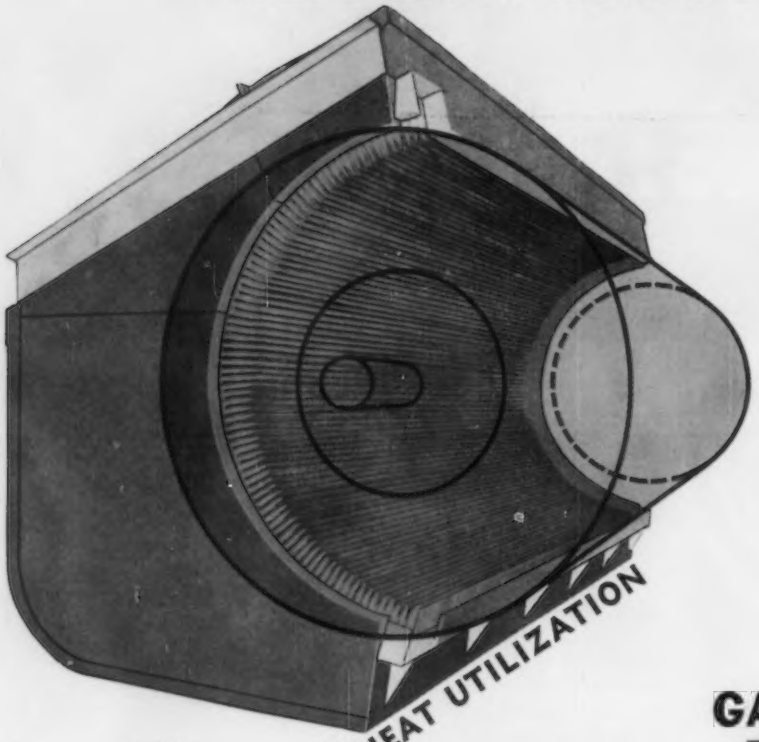

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Paper Trade Journal | WEEK OF NOVEMBER 24, 1958

Promoting Georgia-Owned Mill for Georgia

Substantial progress and growth was reported at the recent directors meeting of Southern Land, Timber & Pulp Corp.

The purpose of this corporation is to build a newsprint and foodboard paper mill. It is now acquiring timberland, through ownership or lease, to assure a continuous flow of pulpwood to the mill, according to president J. J. Neely, "although the corporation's land acquisition program is only little more than a year old, it has acquired more than 42,000 acres and has 8,000 to 10,000 acres in the process of being closed." Most of this land is well stocked with growing timber; however, those acres that are not growing timber will be planted during the current season.

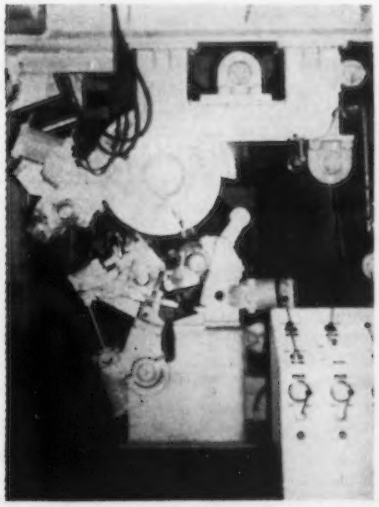
Southern Land, Timber & Pulp Corp. is making available to the people of Georgia (stock sold only to residents of Georgia) "the opportunity to share in the development of our natural resources through the establishment of a pulp and paper mill in the state owned by people of Georgia."

Mr. Neely reported a 50 per cent increase in sales force during the past four months. 954,514 shares of stock have been subscribed by more than 2,400 Georgians in 128 counties, 679,514 shares were subscribed during the last four months of sales. The present selling price of stock is $4.04 per share. Office of the company is in Manchester, Ga.

New Board Coater at St. Marys

St. Marys Kraft Corp. has just completed a coater installation of its No. 2 bleached kraft board machine in St. Marys, Ga., which is unique in many respects.

Among the interesting features are a metering system that controls the application of the coating to the dry sheet



and a Beloit trailing blade coater of the inverted type wipes off all excess and permits it to flow back into the metering pan and recirculate on the metering roll and coating screens.

As the sheet is led around the first dryer past the coater, the coated surface is "set" by the application of high velocity hot air through a hood arrangement over the dryer. Immediately ahead of the coater, an additional paper dryer handles the treatment given the sheet as it comes from the water boxes of the first calender stock. Expander type rolls are positioned in the sheet run ahead of the first dryer and ahead of the coater to properly spread the sheet at these critical points.

(Photo, left, shows metering pan and roll directly under sheet run. Trailing blade assembly at the left of the roll. This entire blade assembly is easily adjustable.)

K-C In Full Operation at New Milford

Kimberly-Clark's new tissue paper mill and converting plant at New Milford, Conn. are now in full operation. Earlier this fall the second paper machine was started-up. Now with the production of paper towels the complete line of products planned for the New Milford plant is being made. In addition to towels it includes paper napkins and facial and toilet tissues.

Scholarships Available at N. C. State

The N. C. State College Pulp and Paper Foundation announces that a number of scholarships are available to high school seniors interested in following a career in pulp and paper technology. Major scholarships to be awarded have a value of $500 per year to residents of North Carolina or $750 to residents of other states. Minor scholarships have a value of $300 a year irrespective of residence.

The financing of the scholarships is made possible by membership fees and donations by members of the Pulp and Paper Foundation, Inc.

Any high school graduate or college student in the United States may apply for one of these scholarships. For scholarships and admission applications, interested high school seniors should write to Dean R. J. Preston, School of Forestry, N. C. State College, Raleigh, N. C.

Paper and Board Production

According to the American Paper and Pulp Assn., the ratio of the United States production to mill capacity for the week ending November 8, 1958, was 88.3 per cent compared with 91.1 per cent revised for the preceding week. The ratio was 91.1 per cent for the corresponding week a year ago.

The paperboard production ratio for the week ending November 8, 1958, was 93 per cent compared with 95 per cent for the preceding week and 94 per cent for the corresponding week last year.

(Detailed statistics on page 60.)

Recent Paper Machine Start-Ups

The following is a list of paper machines gone into operation this fall:

Ecusta Paper Co.—Pisgah Forest, N. C.
Hamilton Paper Co.—Miquon, Pa.
Union Bag-Camp Corp.—Franklin, Va.
Kimberly-Clark Corp.—New Milford, Conn.
Hurlbut Paper Co.—South Lee, Mass.
Southland Paper Mills—Lufkin, Tex.
Marathon Corp.—Naheola, Ala.

Individual new machines (apart from new mills) slated for start-up in 1959:

Bowaters Southern—Calhoun, Tenn.
Champion Paper & Fibre—Canton, N. C.
Halifax Paper Co.—Roanoke Rapids, N. C.

Gentlemen:

Our work includes problems relative to vibration damping and structures design for airborne electronics use. This would include damping effects of various kinds of joints, materials, etc.

It would appear that there may have been investigations made as to the use of compressed or laminated paper, possibly foil coated, for chassis for short-lived electronics. Probably some waterproofing or plastic impregnation such as high damping cellulose acetate butyrate would be used. If you have any reports or data on this, it would be appreciated. If the data were available on loan, it could be returned in a short time.

Thank you for any comments.

Very truly yours,
R. E. Shafer
Radio Corporation of America
West Coast Electronic Products Dept.

Mando Suggestion System Nets Idea for Preventing Wire Damage

Viewing the award-winning invention are (l. to r.): N. L. Jurgenson, general superintendent paper division; A. J. Gordon, secretary of awards committee; Carl Roberson, boss machine tender turned inventor; and W. H. Schlafge, general manager of Falls division.

An idea to prevent damage to paper machine wires during installation has paid off for both Minnesota & Ontario Paper Co. and Carl Roberson, boss machine tender at the International Falls, Minn. mill.

A cash award for the idea was the largest paid under the Mando Suggestion System since the system was established in 1945, according to W. H. Schlafge, general manager.

Mr. Roberson submitted both the idea and design for a stainless steel shield, shaped to cover the bottom of the couch roll while a new paper machine wire is being installed. Resembling a trough with one open end, the device has a cylindrical sleeve to fit around the journal of the couch. When a wire is being changed, the shield is slipped over the exposed journal to keep the wire from snagging on bolts and other projecting parts.

Already in use at the Falls mill and reportedly very effective, the shield will increase paper production because of less lost time for wire patching, will extend the life of costly wires and result in a saving of labor through fewer wire changes.

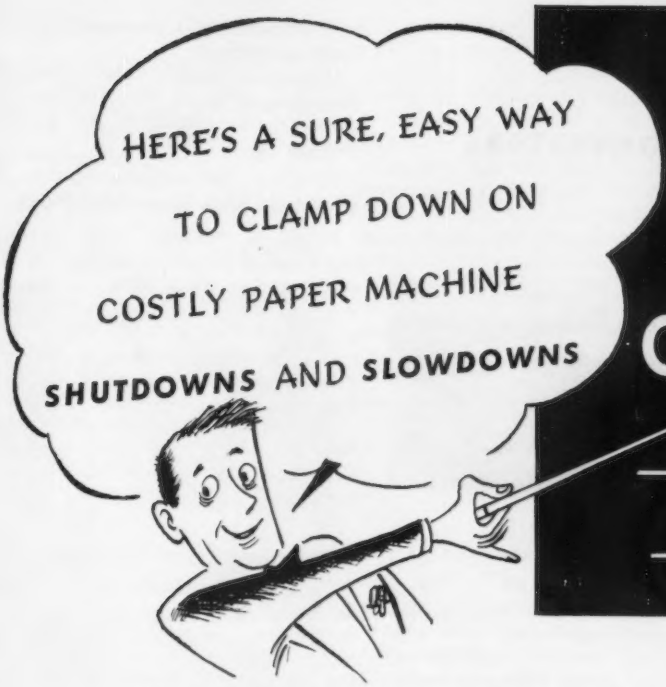
Mr. Roberson's award of $573.50 was based on the Suggestion System formula by which the company pays for acceptable ideas at the rate of 10 per cent of anticipated savings the first year a suggestion is applied.

Does Your Paper Need That Certain Fragrance?

Fragrances with a life of two years or more can be imparted to fibreboard and many other types of paper stock, by incorporating in the pulp new, patented odor-retentive chemicals which have been placed on the market by Tyrex Drug & Chemical Corp., 29 Pearl Street, New York 4, N. Y. The new chemicals, which are individually formulated to meet specific requirements can be produced to duplicate almost any known fragrance, and in forms suitable for incorporation in any type of paper pulp.

Described as saponified derivatives of natural perfume oils, the compounds have the unique feature of combining a relatively low initial emission of the fragrance and an extraordinarily long fragrance life. This is in sharp contrast to the action of untreated perfume oils, which often emit an objectionally strong initial odor, with the effect rapidly diminishing within a few days.

The compounds, which can be supplied either as crystalline solids or as liquids, are extremely easy to incorporate, and in most instances will involve no changes in the paper mill's production processes. In addition to working with paper mills in formulating the fragrances, Tyrex will offer technical assistance in recommending procedures for incorporating them. The compounds are very light in color and will not affect the color of the finished paper stock.



install VICKERY CONDITIONERS

— on your press felts

— on your wet felts

Today, there's no excuse for letting a felt run dirty or clogged. There's a Vickery Felt Conditioner for press felts on big, high speed Fourdrinier machines as well as small, slow speed machines — for top and bottom wet felts on cylinder machines, too.

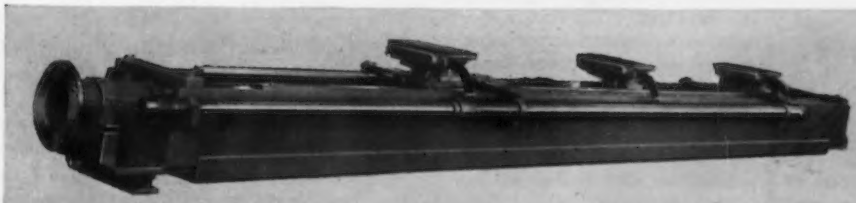
Keep every felt continuously clean and open with Vickery Felt Conditioners.

BIRD MACHINE COMPANY, South Walpole, Massachusetts

Regional Offices: EVANSTON, ILLINOIS • PORTLAND, OREGON • ATLANTA 9, GEORGIA

Canadian Manufacturers of Bird Machinery • CANADIAN INGERSOLL-RAND CO., Limited, Montreal

Close-up of one of the conditioning boxes on a Vickery Felt Conditioner for a wide, high speed press felt. The Conditioner is hydraulically driven and is equipped with a traveling header containing the complete unit. There are no projections beyond the paper machine frame.



This hydraulically driven Vickery Wet Felt Conditioner is readily adjusted to match the speed of the cylinder machine. Every inch of the felt gets full and equal conditioning treatment.

New Plant for Wyomissing

Wyomissing Paper Products has awarded a contract for design, engineering and construction of a new 150,000 square foot plant in Reading, Pa.

Wyomissing is a leading producer of flint and glazed papers for use in set-up and folding boxes, phonograph record labels and other packaging requirements and also of cloth-lined papers for maps and heavy-duty purposes.

According to S. R. Fry, president, the primary purpose of the move is to modernize the company's facilities and to allow for future expansion on an efficient straight-line basis. The site was chosen because of its easy access to all Eastern metropolitan markets; it will have its own railroad siding and is also convenient for truck shipment via high-speed turnpikes.

Schulz Sells Div.

A. Geo. Schulz Co., Milwaukee, has sold its Paper Tube and Can Division to Midwest Paper Tube and Can Co. The sum involved was not revealed.

According to the Schulz Co., equipment, inventory and work in process were included in the sale. The company, which is a large paper box producer, felt the division "did not fit into our other lines." Employes will be absorbed in other Schulz operations.

Midwest Paper Tube and Can, 1931 S. Allis St., is a newly formed organization. Its officers are H. J. Berenson, president; J. C. Mahoney, vice president; Mrs. Lottie Young, secretary; and A. G. Sturgeon, treasurer. Mr. Berenson previously was president of National Paper Can and Tube Co., 401 S. 47th St. Mahoney and Mrs. Young were associates of his in the venture. The firm was sold to a St. Louis company.

Container Corp. Names McDowell Director

James F. McDowell, formerly general sales manager in Chicago for the Container Corp. of America, has been named to the newly created position of director of sales at the Downing Box Co., Milwaukee, Wisc.

Grant President Of Conn. Manifold

A management reorganization of Connecticut Manifold Forms Co. will place Ellsworth S. Grant in the presidency of the West Hatrford firm Dec. 1, it was disclosed. He succeeds John Collidge of Farmington who continues with the company as chairman of the board.

Grant recently resigned from the Allen Mfg. Co. where he held the post of vice president and industrial relations director. He is also a director of Kaman Aircraft, the Newton Co., the West Hartford Publishing Co., the Hartford Chamber of Commerce and the Renbrook School.

Connecticut Manifold also announced Harold A. Strom of West Hartford remains as vice president and general manager of the firm.

Webber Has New Mill Post

Orbbie K. Webber, safety director and assistant personnel manager in the northern New York plants of the St. Regis Paper Co. for the past two and a half years, will leave the area at the end of November to take up his new duties as personnel manager at the East Pepperell, Mass., mill, effective Dec. 1.

Mr. Webber first came to northern New York in March, 1956, from the Toledo, O., bag plant of the St. Regis company.

Container Firm Expands

Tavens Container Corp., Cleveland, has added enough equipment to double its capicity since its move from its former facilities. The recent move saw the company transferring from 14,000 square feet of leased space to 55,000 square feet of owned space.

Also announced was promotion of Richard I. Sutker from a member of the sales department to sales manager and the addition of Herman B. Polen to the company's industrial sales division. The company makes folding paper boxes.

Building at U.S. Envelope

Construction of a building of approximately 50,000 square feet to be tied in with the present building of the Atlanta Division of United States Envelope Co. at Doraville, Ga., was announced by Eldon V. Johnson, USE president.

The new building will increase the Atlanta Division's space by 166 per cent. It will meet the need for additional space to take care of increasing volume for the future and the installation of a tablet department.

Scott Receives Patent on Perf-embossed Process

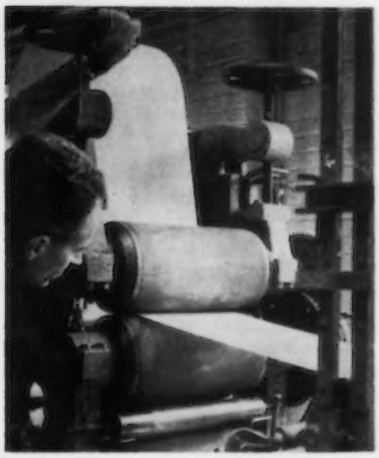
Details of a unique process that gives paper new high standards of absorbency, softness, and other properties have just been disclosed by Scott Paper Co. Originally developed as a solution to the problem of making oil-absorbent paper for industrial wiping uses, the process also gives paper characteristics that are desirable for other applications. The U. S. Patent Office recently awarded Scott the patent covering both the "Perf-embossed" paper, and the process by which it is made.

"Perf-embossed" paper is made by the patented process which both perforates and embosses the paper sheet and thus accounts for the product's name.

In addition to the Scott line of industrial wipers, other products now are manufactured by the company from types of "Perf-embossed" paper. These include Scott UHA (ultra high absorbency) towels, and "Dura-Weve," a laminated material consisting of two double plies of paper and rayon scrim. Guest towels, tablecloths, medical examination garments, aprons, and headrest covers now are being made from "Dura-Weve."

How It Is Done

Secret of the patented process is the use of a pair of specially engraved rolls that can simultaneously, perforate, weld, and emboss the plies of paper fed between them. The process differs from ordinary embossing in that matched, mating male rolls are used. Most of the paper being processed remains uncompressed and, therefore, absorbent.



Various types of "Perf-embossed" paper are made at Scott, on this laboratory experimental model. The operator is adjusting clearance between the embossing rolls.

Various puncturing devices were tried to perforate high wet strength industrial papers but without much success. Happily, one of the inventors tried pressing this type of paper between two sheets of heavy window screening, and so produced the first successful "Perf-embossed" paper. The resulting paper had the following properties:

1) Improved oil absorbency resulting from increased capillarity.

2) Good oil capacity due to the uniformity and depth of depressions which act as "reservoirs" for absorbed oil.

3) Good adhesion between the several plies of the product.

4) Highly increased bulk resulting from the thousands of crests and depressions in the paper plies.

5) Improved wiping surface for soaking up oils, dirt, and extraneous foreign matter.

Subsequently, development work led to the attachment of wire screens to hand-operated wheels which provided the necessary backing pressure as paper was fed between them. Calendar rolls covered with wire screening were then tried on a pilot plant basis. Later, engraved rolls were developed and put into full scale use. Paper produced on the engraved rolls had substantially greater oil-absorbent properties than that made on the wire-covered calendar rolls, due to refinements made in pattern design. This method also is conducive to high speed production.

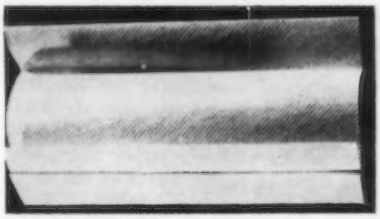
Engraved rolls used in the process give paper high cross-directional stretch, a feature that has been the goal of numerous experiments in the paper industry for many years. Paper that has equal stretch and strength in all directions has greater functional versatility.

Each wire-design pattern engraved on mated sets of rolls is essentially the same—the high areas of one roll extend into low areas of the other. As paper passes between the rolls, depressions are formed on each side. These become the crests, or nodules, on the opposite side of the paper. Thus, both surfaces of the paper are formed into a nubby texture.

Key to Success

In ordinary embossing, fibers of paper are compressed and surface areas become stiff and non-absorbent. In the Scott process, however, the only areas of the paper compressed by the engraved rolls are the sloping sides of the raised bumps, or crests. The top of the crests, and the bottom of the cup-like depressions between them, retain their original softness and absorbency.

Various sets of matched engraved rolls are designed and the machine can be adjusted to work the paper to various degrees in the sloping areas of the crests. The fibers in these areas either can be perforated, ruptured, compressed, or stretched, depending on the type of "Perf-embossed" paper being produced.



Close-up of a Scott Ultra High Absorbency (UHA) Towel showing its "Perf-embossed" pattern. The exclusive process, recently patented by Scott, gives the paper high absorbency and texture-like surfaces.

Scott Wipers, for example, have relatively large apertures to increase their oil absorbency feature.

The perforations in paper used for Scott UHA Towels are not as large, because oil absorbency is not the critical need. The process, however, does impart other properties required for a paper towel. These include softness, porosity, stretch in all directions, bulk, and textured appearance.

Pulp and Paper Mill Instrumentation

by E. J. Cole & M. Todd, appendix by R. B. Lundy

This is the first book ever published which exclusively deals with automatic control, measurement, and other forms of instrumentation as specifically applied to pulp and paper processes. Price $3.50.

Subjects Covered

Automatic Reduction & Handling of Instrument Data
Bleach Plants
Chemi-Groundwood Mill
Continuous Semi-Chemical Pulping
Groundwood Mill
Groundwood Production from Chips
High Yield Sulphite Pulping
How to Develop an Instrument Maintenance Department
Kamyr Continuous Kraft Pulping
Kraft Pulp Mill
Measurement of Process Variables
Organization and Duties of an Instrument Department
Paper and Board Making, Part I
Paper and Board Making, Part II
Principles of Automatic Control
Principles of Controllers
Sulphite Pulp Mill

Lockwood Trade Journal Co., Inc.
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Arthur Snapper

Henry Fowler

Arthur Snapper Elected President of Nicolet Henry Fowler Becomes VP

A change in top management of Nicolet Paper Corp., of West De Pere, was announced following a meeting of the board of directors.

William Heller, Sr. has relinquished the post of president of the company, which he has held since 1948, but will remain a member of the board.

Mr. Arthur Snapper was elected to succeed Mr. Heller as President. Mr. Snapper was formerly vice president of Nicolet Paper.

At the same time, Henry Fowler, general manager of Nicolet since 1955, was elected vice president of the company. He also retains the title and duties of general manager.

Three Managers Named at Oxford

Oxford Paper Co., has announced the appointment of three regional sales office managers who will be assisting regional sales personnel.

Matthew B. Mowat for the Western Sales Region headed by Thomas F. Nolan, Jr., western sales manager, and Samuel D. Dillon, assistant western sales manager. Mr. Mowat will take over his new duties in January 1959. He has been with the Oxford Paper Co. since 1933 and prior to his new assignment was a member of the Sales Service Department in New York.

George L. Keckler, with Oxford since 1942, will take over his duties immediately with the Atlantic Region headed by Kenneth V. Wolf, Atlantic sales manager. Mr. Keckler was formerly assistant supervisor of the Order Department in New York.

Henry W. Park will also assume his new duties immediately in the Northeast Sales Region headed by C. Rickert Lewis, Northeast sales manager. Mr. Park has been with Oxford since 1951.

Coordinator of Sales For Riegel Corolina Division

A. P. Mitchell, senior vice president-Sales, Riegel Paper Corp., has announced the appointment of Noel R. Phillips to the newly-created position of technical coordinator of Carolina Paper Sales. In his new post Mr. Phillips will report to William J. Garrity, manager of Carolina Paper Sales, and will serve as liaison between the Sales Division and the manufacturing departments producing the various grades on Riegel's new paperboard machine, the "Carolina Belle." Mr. Phillips joined Riegel as technical director of the Carolina Division in June 1954 and served in that capacity until his recent appointment. At present, no successor has been named to Mr. Phillips' former position.

Saunders Replaces Greenman at Munising

George Saunders has joined the Development and Research department of the Munising Paper Co., replacing Ed Greenman, who has been transferred to Neenah, Wis., by Kimberly-Clark Corp.

Gorrell Promoted To New Post

Kenneth M. Gorrell has been promoted to the newly-created position of assistant director of marketing research at Scott Paper Company.

In this new position, he will report directly to Gordon A. Hughes, Scott's director of marketing research. Gorrell's experience includes five years in marketing research and six years in distribution accounting. He will assume new administrative responsibilities, including work in the increasingly important areas of economic and sales analysis and market estimating.

Holden as Delegate at Geneva

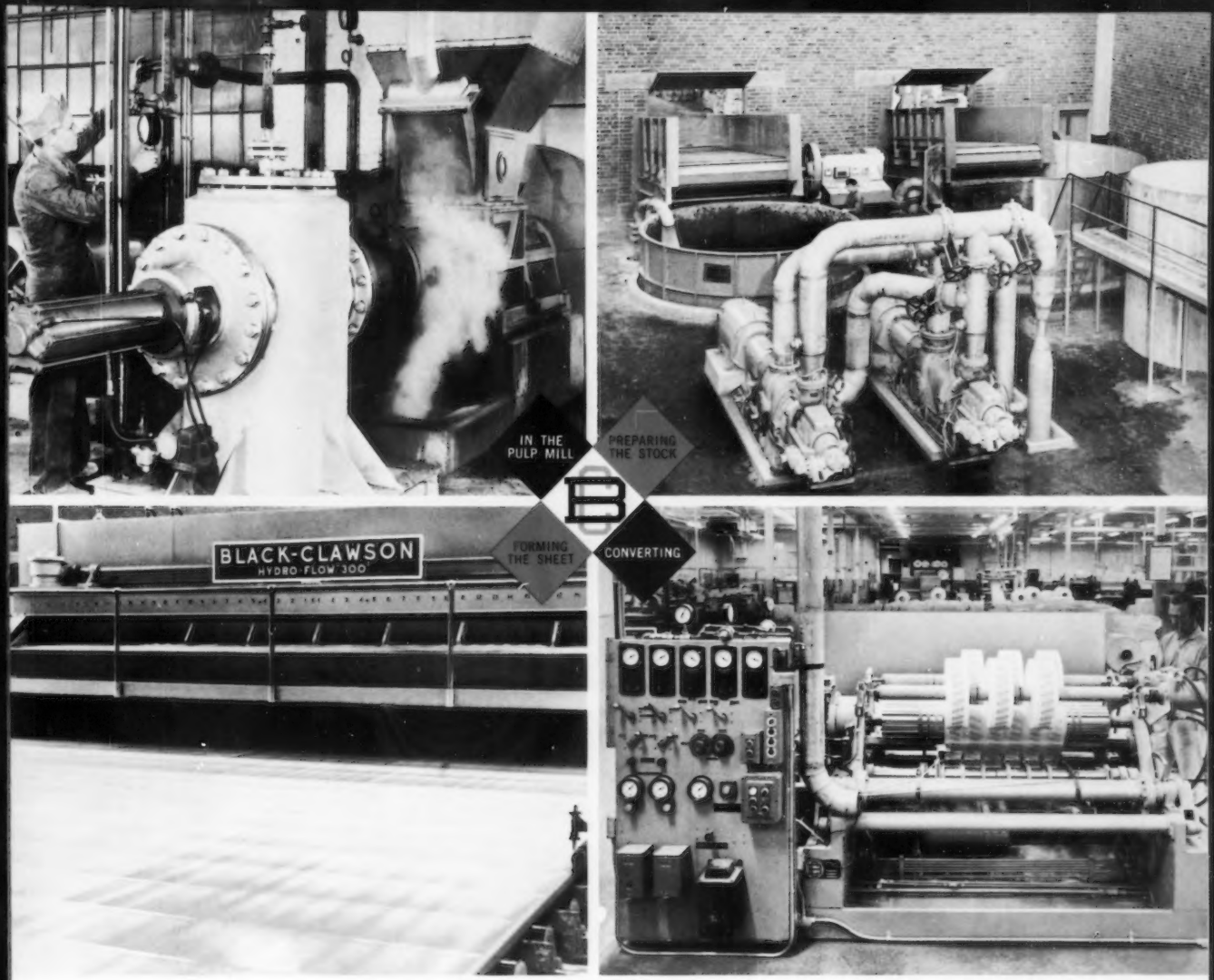
Harold Holden, vice chairman of the Board Standard Packaging Corp., will be representing the American Paper & Pulp Association, the National Association of Manufacturers and the U. S. Chamber of Commerce as an Employer Delegate to the International Labor Organization Tripartite Meeting in Geneva from December 8-19.

Harold Holden

The International Labor Organization consists of 74 countries, but this meeting will be concerned principally with the 25 countries that are in the pulp, paper and lumber industry, and the discussions will revolve around labor management relations in the timber industry.

It is Mr. Holden's intention before going to Geneva to visit his counterparts in the European countries in so far as he can and particularly in Russia as they are part of this international convention. He has a visa for 5 days in Russia and hopes that he will be able to see the men who subsequently will be representing USSR and the other countries in Geneva.

His principal stops will be Germany, Norway, Sweden, Finland and Russia.



In Every Paper-Making Process . . . BLACK-CLAWSON *is There*

. . . giving engineering assistance at every point

Through its four specialized manufacturing divisions, Black-Clawson provides sound engineering assistance at every point in the paper-making process, from the pulp mill to the converting line.

Only a multi-division organization, with the largest, most talented group of paper mill machinery engineers in the world, can offer complete service, work with a mill or converter on any engineering problem that may come up, on any grade from tisssue to board.

Black-Clawson coordinated engineering has served the pulp and paper industry for over 100 years and will help fashion the paper products of the future.

PANDIA DIVISION — PULP MILL EQUIPMENT
SHARTLE DIVISION — STOCK PREPARATION EQUIPMENT
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DILTS DIVISION — CONVERTING MACHINERY

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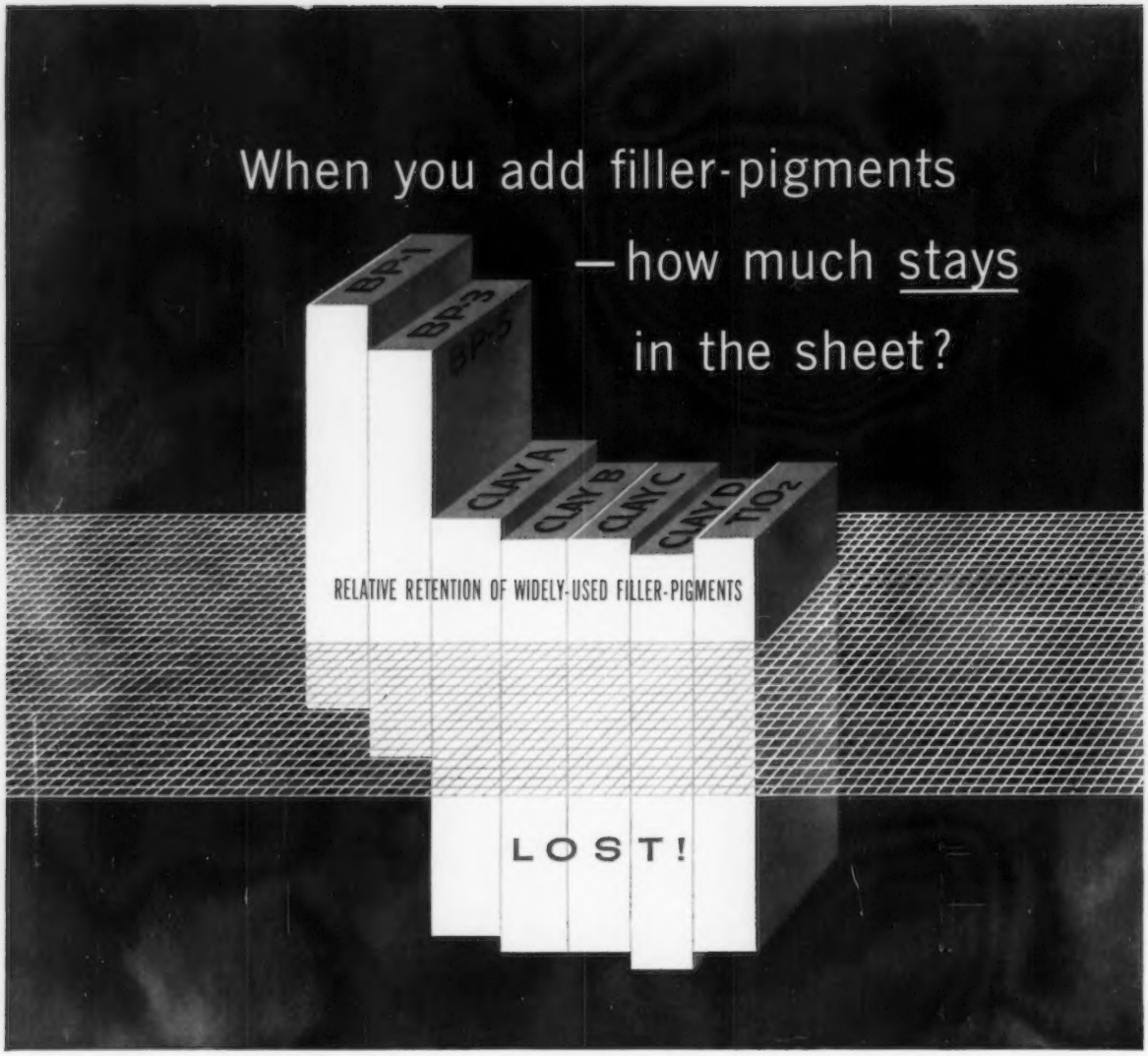

Recent tests prove that 3 times as much high-brightness Dicalite stays in the sheet as any other type of filler-pigment! This startling information, presented here for the first time, was developed in recent tests conducted in a leading Mid-Western paper mill. Two types of furnish were used—patent white and bleached manila, both prepared according to TAPPI T-200-M-45—and the tests conformed strictly to TAPPI T-205-M-53.

We believe that when you consider all the factors established by these tests...the higher retention of Dicalite Paperaids . . . the high brightness of Dicalite (especially BP-1, 89.6 on the G.E. scale) which allows the replacement of substantial amounts of TiO_2 without impairing the brightness of the sheet . . . and the cost advantages of Dicalite, from the standpoint of cost per pound *retained in the sheet* . . . you will find Dicalite Paperaids of greater value than ever before. Definitely, they help you make a better sheet at lower cost.

Write us for more complete information

Dependable GLC GREAT LAKES Dicalite® DIATOMACEOUS MATERIALS

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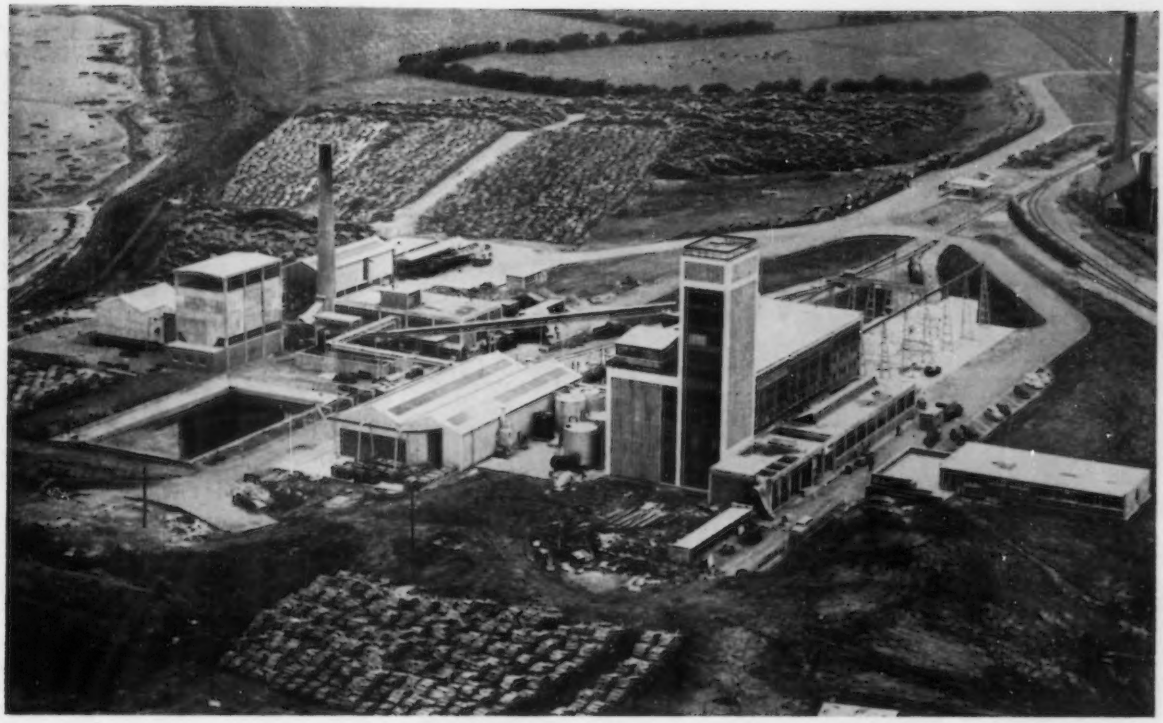


New Semi-Chemical Wood Pulp Mill at Sudbrook Boasts Many Firsts

- First bleached hardwood pulp mill in Great Britain
- First semi-chemical wood pulp mill in Britain
- First Kamyr continuous digester on bleached NSSC pulp anywhere

Eben M. Whitcomb
Editor-in-Europe,
Paper Trade Journal

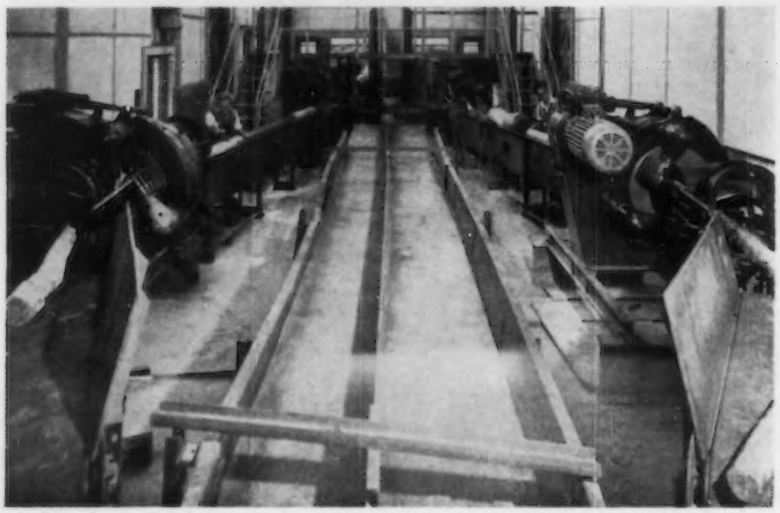
Comments by
T. FRANKEL,
Technical Director
Sudbrook Pulp Mill Ltd.

Early last month, the semi-chemical pulp mill of Wiggins Teape & Co. at Sudbrook, Great Britain, was officially opened. This extremely interesting mill is the first in the world to use a Kamyr continuous digester to produce bleached neutral sulphite semi-chemical pulp and the second anywhere to use this digester for NSSC pulp. (The other installation will be the subject of an early article by this author). It may surprise our readers to learn that this mill may well be the forerunner of a number to use local hardwoods which are quite plentiful in some areas of Great Britain. The deterrent factor to this growth is more likely to be water than wood.

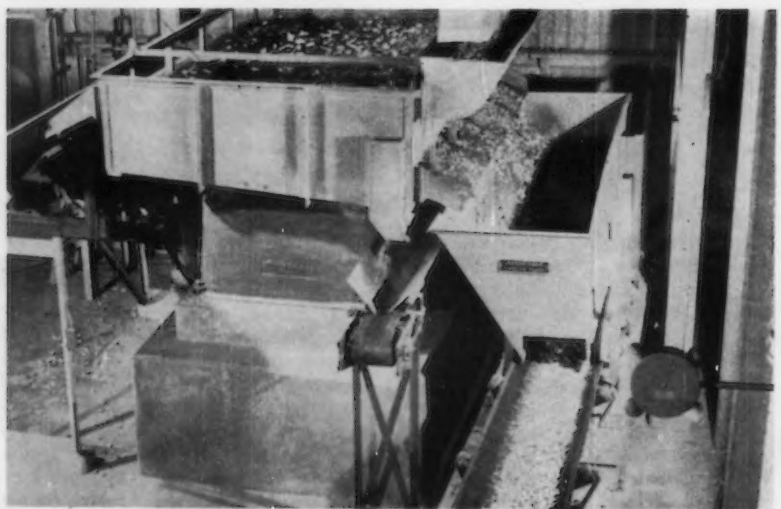
When the author submitted this article to Dr. T. Frankel, Technical Director of the company, the latter provided a number of interesting comments. Rather than incorporate Dr. Frankel's remarks in the article, we have introduced them at the relevant points in the text and so indicated by using different type.

It is not correct to describe Sudbrook as the first pulp mill in England because there have been two old small sulphite mills, and Bowaters are producing groundwood on a large and efficient scale. The correct description is that this is the first mill for bleached hardwood pulp in Britain and it is also the first mill to make bleached pulp by a continuous process in Britain, and finally, it is the first mill making bleached pulp from mixed hardwood by the Kamyr process anywhere in the world. (T.F.)

After weighing in at gate, logs are unloaded by mobile crane using wire slings.



Two parallel barking lines each have two Cambio barkers in series.



Soderhamn chip screen showing screened chip, reject and sawdust conveyors.

Background

The Wiggins Teape Group, with 15 papermills in Great Britain and a part interest in three others overseas, produces a very wide variety of fine papers. Continued expansion of production has created an increased demand for papermaking fibers. In particular the need for a specialty bleached hardwood fiber became of great importance. As a result of this need the extensive Central Research Organization made preliminary surveys of pulping processes, and in close cooperation with the British Forestry Commission investigated the suitability of available wood. These investigations indicated that the project was feasible, that sufficient wood was available, and that it would be beneficial to England and to Wiggins Teape to make use of it.

To determine whether hardwood species available in Southern England were as suitable for the manufacture of bleached pulp as similar species utilized in United States, representative logs were shipped to the U. S. Forest Products Laboratories at Madison, Wis. and were pulped and bleached there. (T.F.)

The neutral sodium sulphite process selected was originally a British invention dating back about a hundred years to the period when esparto and straw were first used for papermaking.

Your reference to the fact that the use of sodium sulphite for the neutral pulping of vegetable matter was first developed in Britain is, of course, quite correct. I feel that at this point an acknowledgement of work in the U.S.A. is justified. In your country this known process was applied first to the use of hardwood species for the manufacture of bleached pulp, and the laboratories in Madison, as well as some other Americans, have played a leading role in this development. We have special reason to be grateful to them as your compatriots have permitted us to visit their mills and to benefit from their theoretical and practical experience. The Wiggins Teape Group has, through our research department, negotiated technical co-operation with a number of leading American pulp and paper mills and Sudbrook is looking forward to the visits we expect from your American colleagues in order to return their hospitality and to show them what we are doing. (T.F.)

Selection of Mill Site

The selection of the site for the Sudbrook pulp mill was governed by two main requirements; the proximity of hardwood and fresh water. Since the largest concentration of Wiggins Teape mills are in Kent, it was that area which was first explored for a site. No suitable location was found, mainly because of scarcity of water. An official of the Forestry Commission advised Dr. Frankel, the director of the pulp mill project, to "go west, young man." The advice was good, and an ideal site was found at Sudbrook, near Shepstow in an area surrounded by deciduous woods with an ample supply of fresh water.

The move westward was made more attractive by the fact that Wiggins Teape had, by the time the decision was made, increased their interests in South Wales by adding to the new papermill at Bridgend and acquiring a large papermill at Ely and a coating plant at Treforest where N.C.R. paper is now made.

Wood Supply

While the continuity of future supplies of wood for the Sudbrook mill rests for a large part on small land owners, Crown Lands under the administration of the Forestry Commission will supply about a fifth of the annual consumption of the mill. The Forests of Dean are the second largest Crown Lands in England, and the Sudbrook mill will consume about 80 per cent of that forest's thinnings.

Since this will be the first time that a market for pulpwood has existed in this area the company has been able to institute several innovations in wood handling without the necessity of changing from former practices. First: all wood delivered to the mill is so piled that it can be unloaded with wire slings. This permits the entire woodyard handling to be accomplished by the use of cranes. Second: All wood is purchased by weight rather than volumetric measurement. This latter policy makes it advantageous to suppliers to deliver wood as newly cut as possible for maximum moisture and weight. In turn this "green" wood results in maximum efficiency in bark removal in the Cambio barkers. Trucks are weighed as they enter the plant then reweighed together with any non-acceptable logs upon leaving.

The use of green wood is not only contributing to barking efficiency, as you correctly describe, but also gives the greatest pulping efficiency in the mill and the best pulp quality for the paper mills. Our wood procurement and handling is, therefore, based on immediate utilization without storing the wood on delivery to the mill. The wood yard has only one purpose, namely to provide a moderate stock to balance the reduced intake during the few winter months from December to March. Many of the woodlands in Southern England are on very wet land so that removal of wood during the winter months is not practical, not so much due to frost as due to wet ground. Our system is, therefore, based on the assumption that in spring and summer we will receive supplies larger than the consumption and these logs, after barking, will be stored in the yard to make up the winter deficiency. (T.F.)

Wood Room

Logs begin their movement into the wood room at an elevated decking and feeding area where they are fed manually onto a belt conveyor. The decking area is charged either directly from trucks by crane and sling, or from trailers previously crane loaded in the wood storage yard. Due to the seasonal flooding occasioned by the Severn River (whose 50 foot tides are the second greatest in the world), it was necessary to build the wood room on an elevated platform.

Pulpwood logs are transferred to an inclined drag line conveyor for delivery to one of two lines of Cambio barkers, each line consisting of two barkers in series. Provision is made for by-passing the second barker if one pass is sufficient. This bark, together with sawdust from the chipper, will in the future be burned to produce process steam. Completely barked wood may be sent along to the chipper or loaded on trailers for subsequent storage in the wood yard.

EBEN M. WHITCOMB, our editor-in-Europe, and the author of this article recently spent six weeks visiting mills in Great Britain. While there he visited the Sudbrook mill described here, shortly after the official opening. From England Mr. Whitcomb sailed in his own boat to Portugal where he visited several mills. Our next contact point with him is Gibraltar. He will spend the winter months in the Mediterranean area visiting pulp and paper mills inland in Europe, as well as along the coast.

A chain conveyor carries logs to the 10 knife direct-drive 350 h.p. chipper supplied by K.M.W. Chips are blown by an integral blower to a separating cyclone and then transferred by a screw feeder, bucket elevator and belt conveyor to single Soderhamn flat screen. Oversize chips are currently being recycled to the chipper. Fine screenings are delivered to trucks for disposal with refuse bark. Accepted chips are transferred via an inclined belt conveyor, a bucket elevator, and a plow type distributing belt conveyor into the storage silos which have a capacity of 40,000 cubic feet.

Chip removal from the silos is controlled from the digester room and is accomplished by a mining worm which transfers the chips to a 280 foot belt conveyor which carries them to the digester chip hopper. An interlocking control system prevents the system from operating when the hopper is full.

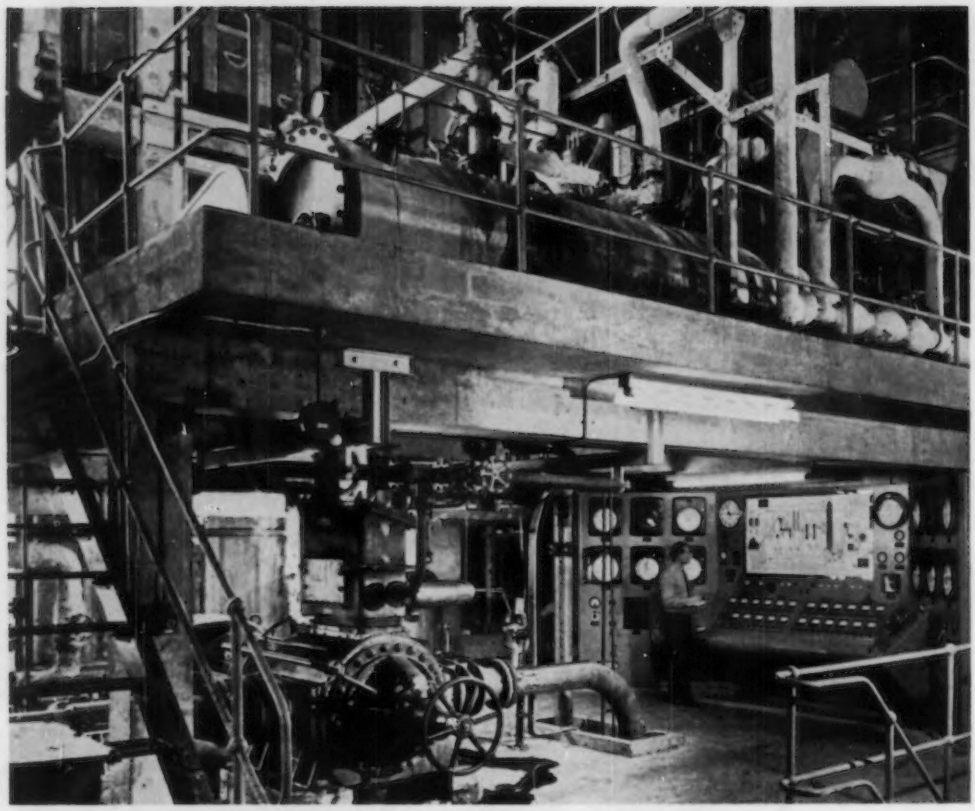
Digester Area

Cooking equipment consists of a Kamyr continuous digester system designed for neutral sulphite pulping, with a basic design rating of 70 tons of pulp per day. The chip hopper is equipped with an electric vibrator to prevent arching prior to the chip meter. Low pressure feeder, steaming vessel and high pressure feeder are of conventional Kamyr design. The digester itself is constructed of stainless clad steel. At the top are located strainer plates through which liquor is drawn continuously and used to convey chips into the digester. This screen is cleaned continuously by a rotating scraper. Cooking liquor is added by a two-stage high pressure pump.

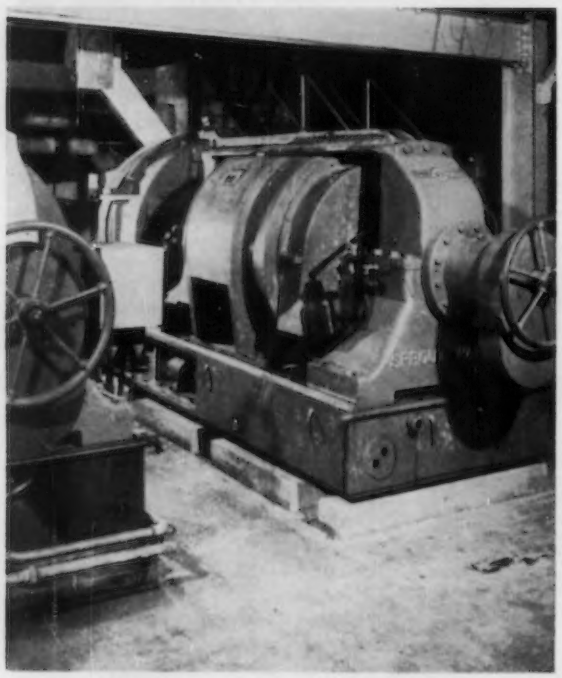
There are two heat exchangers for heating the cooking liquor, either of which may be used to circulate in cooking zones about one half-way down the digester. One exchanger is currently used as spare. After a cooking period of about four and one-half hours, the cooked chips are discharged through a disk strainer to the blow tank.

Cooking Liquor Preparation

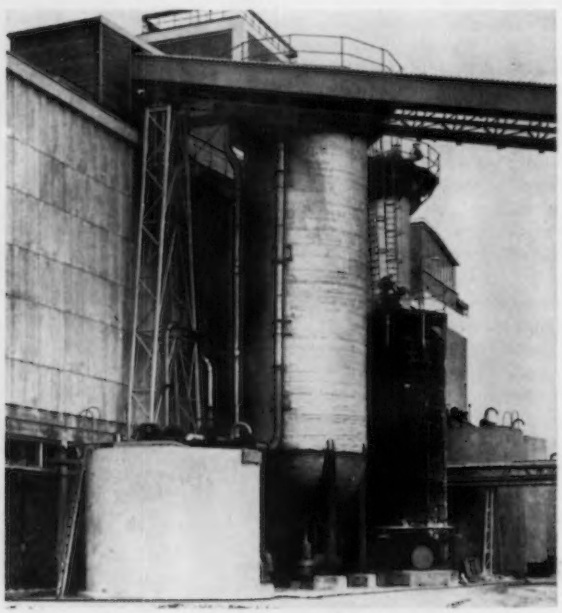
By-product sodium sulphite is received by rail in sealed hopper bottom container from a Monsanto phenol plant nearby. Cooking liquor is prepared by direct dilution with water to 12 per cent, then transferred to one of two insulated outside storage tanks. Iron oxide is removed by periodic sludging of storage tanks from which



Digester area showing: low pressure feeder, steaming vessel, high pressure feeder and control panel (lower right). This Kamyr continuous digester has a basic design capacity of 70 tons per day.



Two Sprout-Waldron disk refiners disintegrate the cooked hardwood chips before washing.



All bleaching towers are located outside the building with attendant washers on operating deck inside.

cooking liquor is decanted. It should be noted that this produces cooking liquor which is 100 per cent Na_2SO_3 and does not contain Na_2HSO_3 or Na_2CO_3 as buffering agents, a condition which is common in more conventional N.S.S.C. systems. This technical advance was made possible through preliminary research by the Wiggins Teape research group and is implemented through the use of a stainless steel-clad digester.

Unbleached Stock Processing

Cooked chips are transferred continuously from the small blow tank through two Sprout-Waldron disk refiners which are arranged in parallel and discharge into a brown stock dilution tank. Pulp is then pumped to the first brown stock washer which uses effluent from the second washer as a washing agent. Effluent from this first washer flows to a holding basin where it is accumulated, to be released only on the outgoing tide and in this manner conform to the standards which have been set up for river pollution.

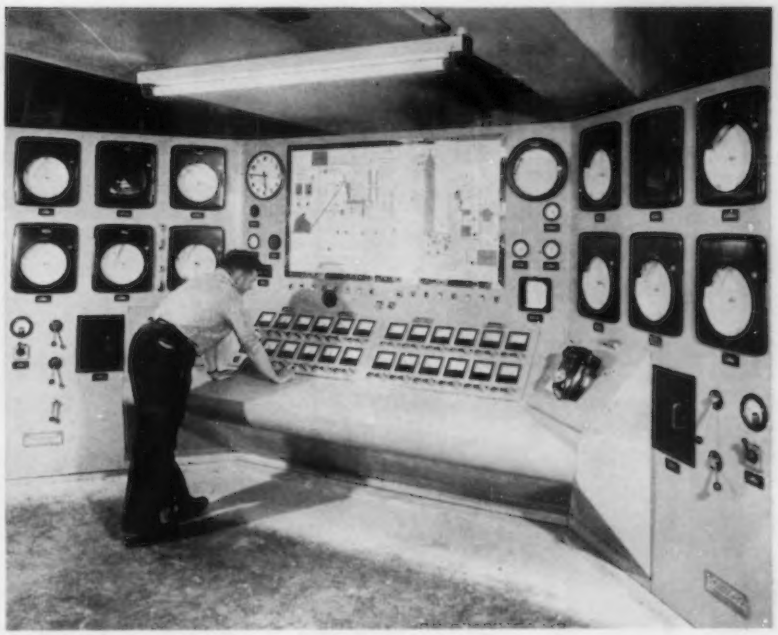
Stock from the first washer flows into a small chest where it is diluted prior to being pumped into a screening system consisting of two Selectifier screens arranged in parallel. Pulp then passes directly into a two-stage system of 12 inch Cyclone centrifugal cleaners (four cleaners in first stage, one cleaner in second stage) fabricated of stainless steel and supplied by Fraser (London) & Co. representing Leje & Thurne (Sweden). Cyclone rejects are returned to the disk refiners.

Cleaned dilute stock is then pumped to the second stage unbleached stock washer through a small surge tank and into either of two stock storage chests.

Bleaching

Bleaching is done in a three stage system designed by Kamyr. The stages are chlorination, caustic extraction and hypochlorite. One unique aspect of this system is that cooking, washing, bleaching and drying are all being performed in the same building which also encloses the technical control laboratory.

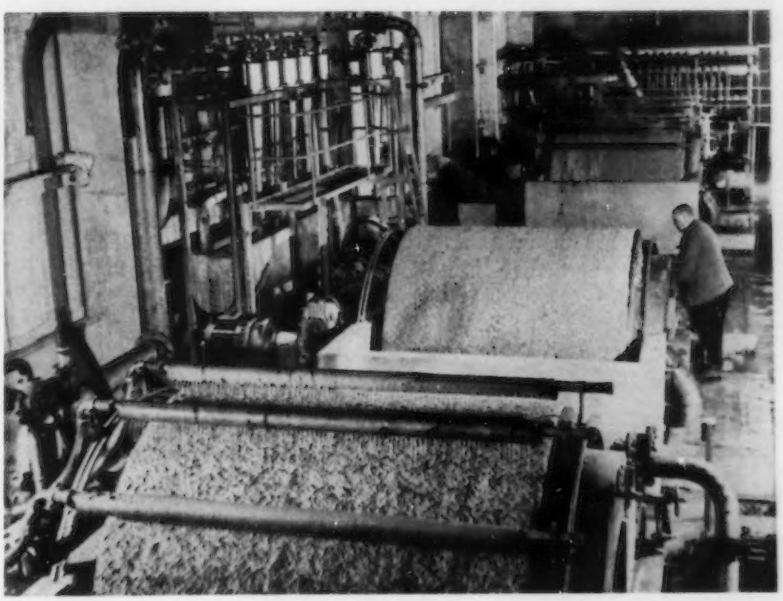
Chlorination is in an upward flow tower at three and one-half per cent with about two hours retention time. After washing, caustic and steam are added as the pulp is transferred by a screw conveyor at 10 per cent consistency to a downward flow causticizing tower with approximately two hours retention time. From this tower stock is pumped to a vacuum washer and then at six or seven per cent consistency into an upward flow hypochlorite tower with about six hours retention time. Bleached stock then falls to a chest where it is diluted to 0.5 per cent consistency and pumped to a three-stage system of six inch centrifugal stainless steel cleaners. (16 in the first stage, 4 in the second, and 1 in the third stage). From these the cleaned pulp is put through a final Kamyr washer and delivered directly to the pulp drying machine.



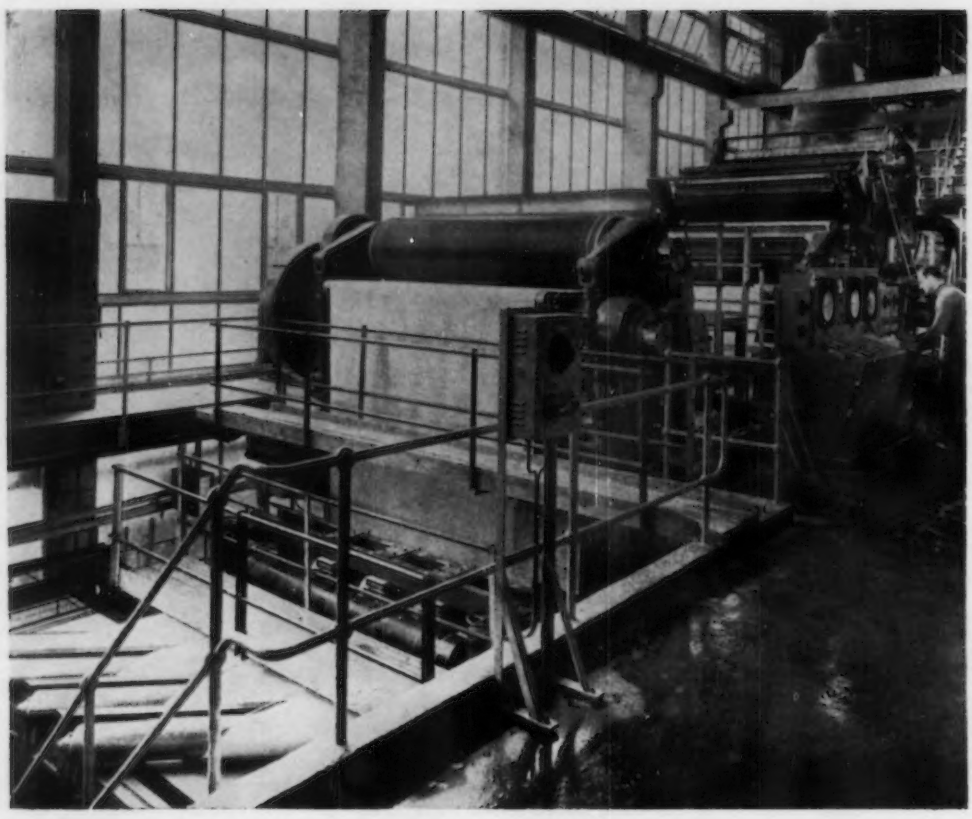
Extensive digester instrumentation and control console as supplied by Foxboro.

An interesting design feature of the plant is the separation of the bleach towers and their attendant washing equipment. Washers are located on the main operating deck of the pulp building. The chlorination, causticizing and hypochlorite towers are located alongside of the building in the open but serviced from the operating deck.

Caustic is received at the mill in liquid form at 50 per cent solution. It is then diluted to 10 per cent and stored



Washer operating floor, with brown stock washer in foreground and bleached stock washers at rear.



Pulp is dried to 50% on Kamyr machine. Web is slit lengthwise (lower left) and after being turned and superimposed, the sheets are cut across and piled.

for use. Hypochlorite is prepared conventionally by absorption of chlorine from railway tank cars in a milk-of-lime solution previously prepared from hydrated lime.

Kamyr Wet Machine Modified

Bleached dilute stock is delivered directly to a conventional Kamyr wet machine which has been modified to include a Yankee dryer between the presses. This dryer which was salvaged from a Wiggins Teape M.G. machine heats the pulp sheet sufficiently to allow greater water removal. The result is that pulp at 50 per cent moisture is delivered to the cutter without further drying.

Bales are loaded by crane for transport to the paper mills of the Wiggins Teape organization.

The pulp cutter which was supplied by K.M.W. is of unique design. The pulp web is split into four sheets which are turned at right angles, superimposed, and cut off four thicknesses at a time. This results in bales which are composites of the entire web. When 200 sheets have been cut, the completed (450 pound) bale is lowered to a conveyor which delivers it to the pulp press, while metal fingers hold the sheets being cut until the lowering device returns to support them. Bales are pressed in an hydraulic press, weighed and tied manually on a system of belt and roller conveyors, and then transferred to outdoor pulp storage by a clamp truck.

Water Supply

The Sudbrook mill is indeed a place where the unique is made to seem commonplace. One quite unusual circumstance concerns the origin of the water supply. In the latter part of the last century the Great Western Railway completed the driving of a tunnel under the Severn River whose great tides made the construction of a bridge over the

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2¼ miles of the estuary impractical. Completion of the tunnel was nearly thwarted by a great fresh water spring which was opened up in the process of tunneling. The pressure which this spring exerted upon the casing of the tunnel has been removed by continuous pumping at the rate of 14 to 34 million gallons a day since that time, dependent upon the rainfall of each season. This water which remains at constant temperature of 50°F is now being pumped to the mill and purchased by Wiggins Teape under a long term contract with the British Railways.

One drawback of this water supply is its extreme hardness, about 450 p.p.m., mostly carbonates. One problem was the formation of CO_2 gas in the digester. This is controlled by venting the tops of the tower. Another problem was the treatment of the boiler feed water. The solution was furnished by the Imperial Chemical Industries utilizing chemical addition instead of ion exchange. Solids control is by blowdown of the boiler water.

Your reference to the mill capacity which is between 20,000 and 25,000 tons of bleached pulp per year is quite correct. You might care to mention that this is a comparatively low output for a non-integrated pulp mill and the scheme is only economical because so many factors have played together for a satisfactory result. It would not have been possible to add the pulp mill to one of the already existing paper mills in the Group, as either availability of water or location in regard to the wood supply made this impossible. In any case, the best result from neutral sulphite bleached hardwood pulp is obtained only by blending with softwood sulphite and softwood kraft. (T.F.)

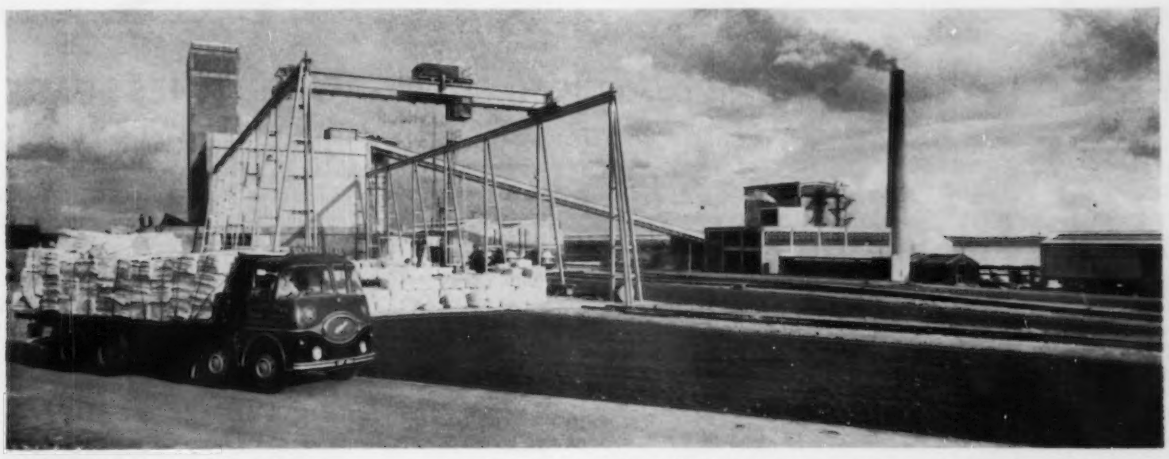
Suppliers to Sudbrook Mill

Pulpmill Machinery

Consultants	Sandwell & Co. Ltd., Canada
Design of Continuous Digester System	Aktiebolaget Kamyr, Sweden
Continuous Digester, Including Accessories	Karlstad Mekaniska Werkstad, Sweden
Chipper	Karlstad Mekaniska Werkstad, Sweden
Chip Screen	Soderhamns Verkstader A.B., Sweden
Barkers	Soderhamns Verkstader A.B., Sweden
Refiners	Sprout, Waldron & Co. Inc., U.S.A.
Instrumentation	Foxboro-Yoxall Ltd.
Stock Pumps	Black-Black-Clawson International Ltd.
Cyclones	Fraser (London) & Co. Ltd. for Leje & Thurne
Baling Press and Conveyor System	John Shaw & Sons (Salford) Ltd.
Washers. (Also representing Kamyr and K.M.W.)	Boving & Co. Ltd.

Buildings and Services

Consulting Engineers	W. S. Atkins & Partners
Main Electrical Contractors	George E. Taylor (London) Ltd.
Low Tension Panel	Johnson & Phillips Ltd.
Transformers & Switchgear	South Wales Switchgear Ltd.
Motor Control Gear	The Belmos Co. Ltd.
Chipper Motor Control Gear	Erskine Heap & Co. Ltd.
Refiner Motor Control Gear	William Steward & Co. Ltd.
Switch & Fusegear, Drives	Lancashire Dynamo & Nevelin Ltd.
Conveyors	James Hodgkinson (Salford) Ltd.
Process Vessels	James W. Ellis & Co. Ltd.
Water Pumps & Motors	Mathew & Platt Ltd.
Electric Motors	Crompton Parkinson Ltd.
Overhead Cranes	Herbert Morris Ltd.
Stainless Steel Pressure Piping	Bolton Superheater & Pipework Ltd.
Stainless Steel Piping	Northern Sheet Metal & Engineering Co.
Steam Boiler	Daniel Adamson Ltd.
Valves	Saunders Valve Co. Ltd.
Mild Steel Tanks	F. Monk & Son Ltd.



Loaded truck stands before the large open area pulp storage at the mill. Note immense storage capacity provided by the overhead crane.

Breath-taking fidelity with four colors on LATEX COATED paper

Paper manufacturers and converters use Dow Latex for paper coatings to improve dimensional stability and ink hold-out and reduce water sensitivity. It makes possible sharper printing and fracture-free folding, assuring customers of highest quality coated stock at very reasonable cost.

DOW

Authentic 19th Century folk art courtesy The Henry Ford Museum

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DOW

Authentic 19th Century folk art courtesy The Henry Ford Museum

No. 3 of a series. LATEX COATED

The "Pennsylvania Dutch" period was a colorful era in American history as the illustration on the preceding page would indicate. Notice how accurately the colorful details reproduce on latex coated stock. In this instance, 80 lb. off-machine coated gloss letterpress paper was used. Careful examination will show why only latex offers such an excellent printing surface.

For fine quality reproduction, specify latex coated papers

When you record your written or pictorial message on latex coated paper
you have eliminated a variable which often means
the difference between a good or a mediocre printing job.

The printer's first consideration is the surface of a sheet,
is it properly coated to receive the inks he means to apply?
Does it have the qualities which will assure sharp, clear reproduction every time?
The answer is yes if the sheet is latex coated.

Paper coated with latex makes it possible to obtain sharp, clear,
true-to-life images no matter what printing process you prefer.

Major paper manufacturers are now using latex in their coatings for paper.
It is used for machine and off-machine coating for both dull and glossy stocks.
For more detailed information on latex coated paper, write
THE DOW CHEMICAL COMPANY, Midland, Michigan, Coatings Sales Dept. 2157.

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- CHILLED IRON ROLLS
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- ROLL CALIPERS
- KNIFE GRINDERS
- ABRASIVE CUT-OFF SAWS

The latest 48" Type C. W. Lobdell Roll Grinder with 30' 2" bed, equipped with variable speed drives, will handle rolls up to 48" diameter, and with a face length of 270"—The Grinder shown below was recently installed at the Hollingsworth and Whitney Division of Scott Paper Company, Mobile, Alabama. Write for details of our latest design.

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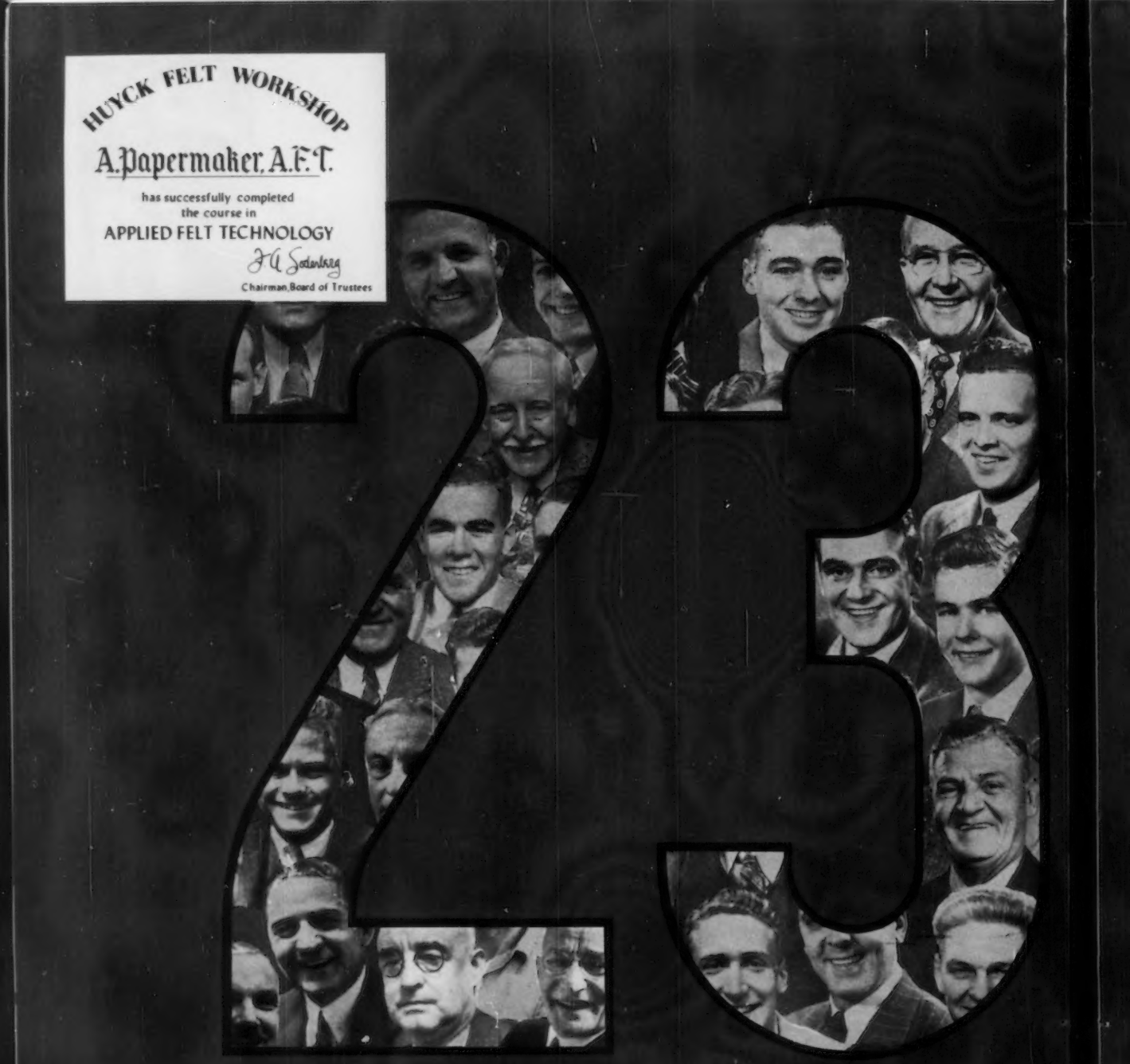

HUYCK FELT WORKSHOPS: 1959 SCHEDULE AT RENSSELAER, NEW YORK

#12 — March 25 to March 27
#13 — May 6 to May 8
#14 — June 24 to June 26
#15 — September 16 to September 18

238 papermakers earn their A.F.T. at Huyck

From mills, located coast-to-coast . . . 238 papermakers traveled more than 250,000 miles to earn their "degree" in APPLIED FELT TECHNOLOGY at Huyck Felt Workshops.

We thank these papermakers for their wholehearted cooperation and interest in learning more about the use and care of felts. They have contributed immeasurably to the establishment of a more productive papermaker-feltmaker relationship.

Both they and their managements have acclaimed the benefits gained from attending these practical and technical workshop sessions. Recognizing their value in helping to produce better paper at lower felt cost per ton, many companies have sent representatives to several workshops.

To meet this continuing demand . . . 4 Workshops have already been scheduled for 1959. To learn about the advantages you can gain by earning your A. F. T., talk to your Huyck Sales or Field Service Engineer. Registrations will be accepted as they are received. Assure your enrollment in the class you prefer by signing up early.

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Conical Versus Disc Refiners — Theory and Mechanics

A. J. Felton
Executive Sales Engineer
Shartle Division, Black-Clawson Co.
Middletown, Ohio

My subject "refining"—so broad in scope and so misconceived that rarely will two papermakers agree on a single method to obtain the end result.

Refining is the process of preparing pulp fibers so that a sheet of paper can be produced that has the desired characteristics required by the end use. Without proper planning in this area of paper mill the sheet may be soft and pliable, may be dense and brittle, or may be so porous that it may not be suitable for the converting process to produce the ultimate product.

Three Angles to Consider

The refining system should be studied from three angles: **1** the end product and specific sheet requirements, **2** limitations of paper machine, and **3** the production goals:

First **1** the end product should be studied relative to maximum and minimum physical tests in mullen, tensile, tear, fold, or crush.

Second **2** the paper machine should be studied to assure the sheet desired can be produced, with proper formation, surface characteristics, strength properties, and desired tonnage.

Third **3** the production goal should be studied to provide information on furnish required, electrical potential and water availability.

Any bottlenecks in these areas will have a definite throttling effect on production and indirectly on company operating profits.

A sound refining plan must include a look at what you have accomplished and how the existing system compares to the ultimate system required. This assures proper planning so that existing equipment will be utilized wherever possible. It, too, points to the weaknesses of the existing refining engines and gives an indication of capacities and limitations.

All refining performance should be gauged by the end objective! For any given sheet, production and furnish there are two or more methods to achieve the end result. The universal yardstick that points the way is horsepower-per-ton-per-day. The numerical value may vary slightly, but you will find that those schooled in refining-system planning will agree within very narrow limits.

Having established the desired power input either from historical data or objective concept, the next step is the selection of the refining engine. Too often theories are accepted without logical reasoning: for instance, some people believe that a head scratcher is a "deep thinker"—more than likely he has itchy dandruff—or—that a fellow who gets up and pulls up his trousers is a "go-getter" type—probably he doesn't want to be embarrassed by having his pants fall down.

So examine the refining engine for design, manufacturer's claims, and logical explanation of refining action.

Two Basic Refiner Designs

There are two basic continuous refining engines: the conical type and the disc type. We have not overlooked the Hollander or finishing beater but its application is so limited in modern refining systems that we consider it usable only in rag stock preparation.

A. J. Felton

The conical and disc refiners were conceived at approximately the same time, in 1850. However, proper metals, bearings, and precision machining were not obtainable and the disc refiner was shelved. The conical type, however, was developed and introduced into the pulp and paper field and advanced to present day design by technological study of results and effect.

Information as to speed, horsepower, and bar structure while available, was not technically applied until the late 1940's and early 1950's. This came about by the influx of technically trained men from respective paper colleges who no longer were willing to accept the old, but raised the question of "why".

Recent studies have indicated a relationship between the relative amount of hydration and cutting and the contact pressure between bars of the refiner filling. The relative amounts of each that can be obtained from a particular refiner are dependent upon relative speed of the filling, bar to bar contact area and stock consistency.

Controlling Amount of Hydration

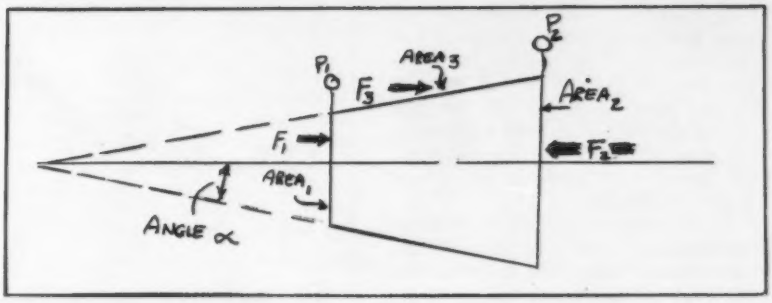
The degree of hydration can be changed by:

1 A change in refiner speed. This will either increase or decrease the backed off (or no load) power which will allow either less or more loading horsepower. The higher the horsepower available for loading, the higher the unit pressure between bar surfaces and consequently the more relative cutting that will take place. Thus for a given drive motor size, the faster the speed, the less cutting is done, mainly because of a decrease in loading factor.

2 Change of bar to bar contact area. If, in a given refiner, the number of bars is increased without decreasing the bar width, the bar to bar area will

have increased. For a given thrust there will be less unit pressure and hence less cutting. If, on the other hand, the bar width is reduced without increasing the number of bars there will be less contact area and more cutting.

3 Stock consistency. This is a matter of viscosity and concentration of stock fibers. A heavier consistency has a higher viscosity whereby the backed off (no load) power is absorbed as turbulence, or mechanical working of the fibers due to resistance to sheer. The difference between refining at two and one half versus five per cent is mainly that at five per cent, twice as much stock is present in a given volume with the result that there is more contact between stock fibers, much less isolation from the water. This same effect would be present in a Hydrapulper operating at five instead of two and one half per cent.



$Area_1$ = small end area, sq. in.
$Area_2$ = large end area, sq. in.
$Area_3$ = projected area, sq. in. $(A_2 - A_1)$
F_1 = thrust against small area, lbs.
F_2 = thrust against large area, lbs.
F_3 = thrust against projected area, lbs.
P_1 = stock inlet pressure, psi
P_2 = stock outlet pressure, psi

$F_1 = P_1 \times A_1$
$F_2 = P_2 \times A_2$
$F_3 = \frac{P_2 - P_1}{2} \times A_2$ (Approx.)

Summation:
$F = F_1 + F_3 - F_2$
(negative result equals inward thrust)

SKETCH 1—LOADING FACTOR CALCULATION DIAGRAM.

Calculation of Loading Factor

The loading factor referred to above may be calculated for any particular refiner under a particular set of operating conditions. This allows a predetermination of the type of treatment on other engines with different speeds and or fillings.

The calculation of this loading factor is shown in Sketch 1.

Summation **F** is the net thrust due to the stock pressure difference only. To this must be added or subtracted the thrust exerted by the handwheel. This new net thrust is equal to the force exerted for refining. In a disc refiner this is the thrust exerted on the filling faces while in a jordan this force must be corrected for the angle of the filling. There is a mechanical advantage as the normal force on the bars themselves is the above net thrust divided by the sine of one half the included angle. This new thrust is the normal force exerted over the gross area of the truncated cone which must be corrected by a factor for each type and size of filling combination.

The resultant in pounds per square inch is now a true contact pressure between bar surfaces.

Conical Refiner Design

Let us examine the basic reasoning behind each of the two designs. As shown in Sketch 2, the conical refiner was designed to adjust for bar structure wear by moving a conical plug into a mating shell. It usually has rather wide bearing centers, has a small deflection due to heavy plug and seeks its own rotating center when rotating in a mass of stock which acts as a lubricating medium around the rotating member. The design permits vernier or minute adjustments for clearance.

Experience has taught us that a narrow bar at slow speed, 1/4 or 3/16" thick at 2000-2700 feet per minute large-end-periphery in two to three and one half per cent consistency will give excellent fiber length reduction. This will impart to the finished sheet good mullen, formation, and give drainage rate control. Wide bar at high speed, ½ or ⅞" thick at 5000-6000 feet per minute large end periphery in four to six per cent consistency at reasonable bar pressure will not give large drop in freeness, nor reduce fiber length to any great degree.

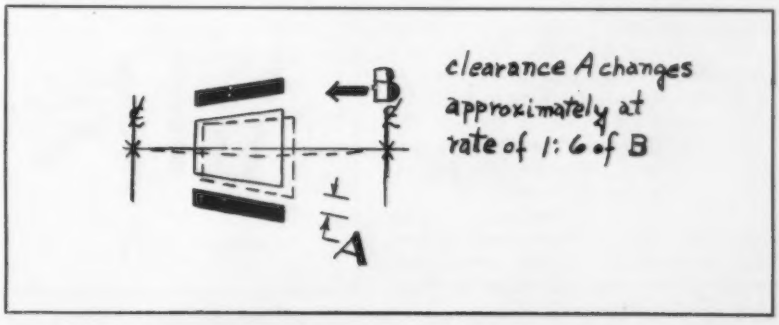
This enhances tear and fold and improves clay coating retention.

There is a strong suspicion that extra wide bars (as in a Bidwell liner) at the lower speed of 2000-2700 feet per minute large-end-periphery, will yield as much hydration at a power savings. There is some indication that some mills are now using this idea successfully. This is obviously an advantage for, as we mentioned previously, the real yardstick is horsepower per ton per day.

Bar material also plays an important part in the effect of any conical refiner. Stainless steel, Type 431 is the best hydrating material because the leading edges round off and the material work hardens when operated in the hydrating range. Chrome-Molly-Nickel alloy is next and phosphor bronze is third. In the fiber length reduction engine, phosphor bronze is best because it wears rapidly and normal to cutting edge and remains razor sharp. CMN alloy is second and stainless steel third.

Consistency also plays an important part in the effect of any refiner. Two to three and one half per cent is the best cutting range since the fibers will tend to mat over the leading bar edge so that the fibers are in the shear area. The bar structure is in close intimacy and shear loads are experienced on all fibrages on bars.

At four to six per cent stock is so dense that the fibers mat around the rotating member so that bar-to-bar contact is not possible and rubbing or hydrating action results.



SKETCH 2—RELATION OF PLUG MOVEMENT TO BAR CLEARANCE.

In the conical type refiner there are wide, deep spaces between the plug bars that contain a large quantity of stock that does not receive the full effect of the bar structure due to first, the path through the unit, second, the high pumping effect of the angled plug and third, the limited circulation of the refined stock. (See Sketch 3.)

There is only a small force to return the stock into refining zone once it has been impelled into shell bar structure. With new fillings having deep grooves, circulation is less than when filling becomes worn. The pressure within the unit is dependent on the inlet pressure plus the pressure head produced by the plug as a booster pump.

At a given intimacy or bar to bar clearance, volume falls off from a maximum when filling is new to a point of replacement at which time the volume is so low production can no longer be maintained. This is true of both conical and disc machines.

Basic Design of Disc Refiners

The disc refiner was introduced into grain defibering and grinding fields where precision machining was not required. The disc refiner had been periodically tried for papermaking but did not reach any great degree of success until bearing design and proper materials became available. This was deemed necessary to give controlled adjustable clearances between the discs.

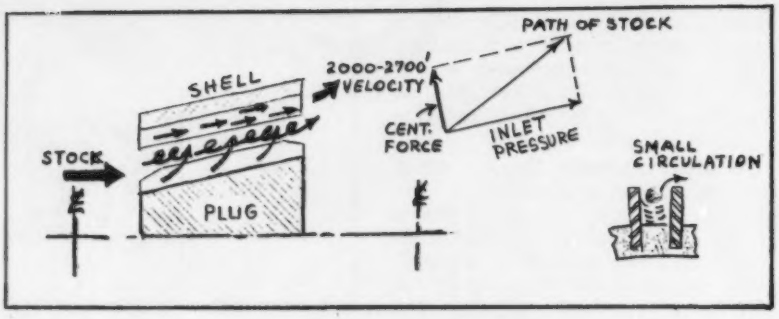
The basic design of the disc refiner was considered to provide the entire refining job in a single pass. No provision was made for independent hydration or cutting action. The theory was to design the bar structure so that more physical contact would be obtained for any given volume of stock and greater fibrillation at a higher freeness. This would result in stronger sheet properties. It was reasoned that a narrow shallow groove, multiple bar disc would do this.

The design consists of flat surface discs, overhung, to allow very short bearing centers and a small amount of shelf alignment on the stock cushion. (See Sketch 4 showing the mechanics of a disc refiner.)

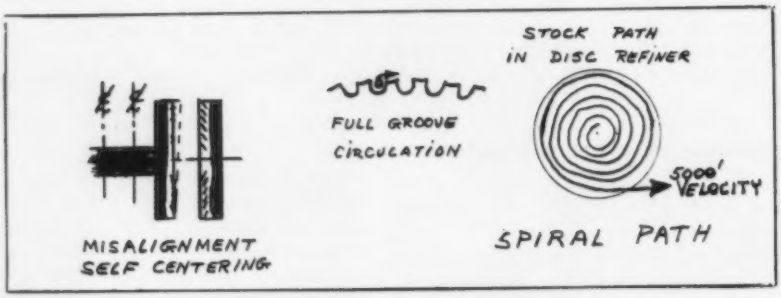
Narrow shallow grooves are intended to give positive full circulation of all stock between the discs. The discs are provided with positive pressure setting (this means clearance between the discs) by external or hydraulic system. The pumping effect is controlled by disc design and gap, and is inversely proportional to the disc clearance.

The discs are so designed and operated that within a certain range the flow rate can be controlled. This is commonly referred to as "pump through" or "hold back." (See Sketch 5.)

It has been the desire of disc-refiner designers to produce pulp that resembles

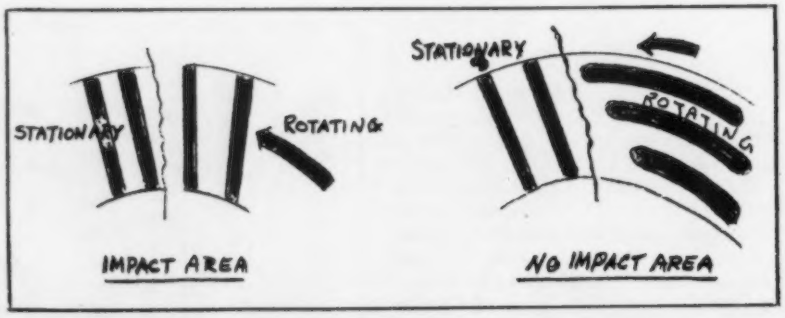


SKETCH 3—FLOW FORCES IN CONICAL REFINERS.



SKETCH 4—BASIC MECHANICS OF DISC REFINERS.

SKETCH 5—FLOW THROUGH TYPE OF DISC REFINER PLATES.



SKETCH 6—THEORY OF PLATE DESIGN — TWO EXTREMES OF BAR ORIENTATION.

standard beater pulp with light jordaning treatment rather than the standard jordan type stock.

Disc design studies reveal that when discs are machined with stationary bar and rotating bar parallel to one another upon impact heavy cutting results. When rotating bars are machined at right angles to stationary bars, no impact area exists at the moment of contact and the unit refines by turbulence and attrition. (See Sketch 6) This type of treatment gives high mullen to tear ratio, high horsepower absorption and very low capacity per unit. It would appear that the final design should be somewhere between these two extremes.

In the disc refiner the volume of fiber available for refining is considerably less than in a comparable size conical refiner. The disc refiner depends on the nip between the discs, the bar pressure and disc design for a type of treatment that gives higher ratio-of-fiber treated per-pound-passed than a comparable conical refiner, which depends in fibrage mat over advancing bar edge and, which is only a small percentage of that fiber available in the deep grooves.

Normally disc refiners operate at approximately four fiber diameters clearance and can pump high-consistency stock. Unfortunately when soft and hard fibers are in the furnish, the hard fibers tend to pinch off and shorten the soft ones. Often the soft fibers are long and impart desirable characteristics to the sheet. This is the cardinal reason why stocks of different strengths should be refined separately and blended at the stuff box.

You may have wondered why a 36" diameter disc refiner with a gross refining area of 1330 square inches has the same size drive motor as a conical jordan with perhaps 3000 sq. inches gross area. The difference between the ratio of bar area to gross areas are such that the actual working bar areas are very much the same.

Disc refiners are well suited to parallel operation. It is possible to retain extreme fiber length and good beating qualities in several units, combine this stock with stock from a disc refiner set up in cutting position, and have a finished sheet that retains not only bulk —but density.

Recent developments in disc design lead us to believe that a bar structure can be developed that will give not only standard hydrating effect but jordan cutting effect as well.

Paper Machine Limits Strength

My experience with refining engines has convinced me that they are capable of developing pulp strengths that the paper machine cannot translate into comparable web strengths. This apparent failure can be attributed to head box, slice, shake, table roll action, length of pond and apron.

Many paper strength tests have included a machine factor. This comprises the tests from headbox stock, formed into hand-sheets, run through TAPPI tests, and compared to dry-end sheet samples put through comparable tests. There have been instances recorded of machine effectiveness as low as 50 per cent. We have instances where primary stock after refiners has 120 per cent mullen, with secondary head box stock at 130 per cent mullen and the machine formed sheet recording only 105. This is not a normal occurrence, but does demonstrate that laboratory tests should not be accepted per se, but only as indicative of the trend possible with the pulp, though not obtainable on the paper machine.

Which Refiners to Use?

The question always arises which refining method is the most efficient and which is properly applied where. In an effort to shed some light on this important subject we examined data from 125 paper machine stock preparation systems where a comparison could be drawn for disc refining, disc-conical refiner treatment, and all conical refiner treatment.

The following data are presented as a record of existing facts and overall comparison between refiner installations. It is recognized that there are many factors not taken into consideration such as, pulp quality, wood species, type of cook, refiner speeds and tackle, and machine speeds which would effect overall power consumption and performance of the installation for the specific paper and board produced. The data is presented merely to show the over-all difference in refining power consumption which is the common denominator for evaluating horsepower days per ton.

It is intended for general interest only and we suggest that direct comparison with your own operations, take into account the many other factors which bear a proper relationship.

Liner Board Stock Refining

In the production of 42 lb. liner board in twelve Southern mills we found this variance (difference in power consumption) between refiner design systems:

	HP/T/D Primary Stock	HP/T/D Secondary Stock
Disc	6.7	15.0
Disc-Conical	7.7	13.8
Conical	8.4	17.6

Variance Disc—versus Disc-conical 14.9% (Primary stock)

Variance Disc—versus conical 25.2% (Primary stock)

All machines produced a minimum of 500 tons daily and no distinction was made for geographic location. All mills used coastal woods.

It is very significant to note here that a great majority of paper makers contributing to this survey felt that the conical refiner applied to secondary stock provides a more uniform fiber length and positive freeness control. The information on liner board is tabulated in Table I.

TABLE I—42 LB. LINERBOARD 11 Machines

	Daily Tons	HP/T/D Primary	HP/T/D Secondary
Disc Refiner only	700	5.5	13.0
	800	6.25	18.7
	475	7.01	19.0
	800	7.5	15.0
	850	7.3	24.2
	Average	6.7	15.0
Disc-Conical Refiners	600	7.5	16.4
	720	6.8	13.9
	750	9.0	11.3
	Average	7.7	13.8
Conical Type only	750	9.7	8.7
	500	9.0	19.0
	500	7.2	25.2
	Average	8.4	17.6

Multi-Wall Bag Stock

In the production of "multiwall bag" it would appear that the opinion of the mill people is that the conical type of refiner provides the type of treatment required for this sheet. We consider this term "Multiwall" not specific since it is not manufactured to a single set of standards but the final tests must cover a wide range of conditions that vary with the end use.

Thus the papermakers must be provided with refining tackle which through experienced manipulation enables them to meet these rigid tests. Here the "art" of paper making is exemplified since they are able to secure desired combinations of cutting and hydrating treatment in a single machine. (See Table II.)

TABLE II—"MULTIWALL BAG" 23 Machines

	Daily Tons	HP/T/D
Disc Refiner only	273	8.25
	200	12.5
	500	9.0
	212	19.8
	Average	12.4
Disc-Conical Refiners	350	9.45

Variance:
Disc verus disc-conical — 24%

Conical Refiner only	300	10.0
	330	10.87
	300	19.5
	336	12.5
	214	19.8
	212	9.8
	200	8.75
	200	27.5
	230	16.7
	225	20.0
	240	8.75
	200	8.75
	120	16.6
	150	13.3
	110	15.9
	60	12.5
	90	19.5
	100	17.5
	Average	14.9

Variance: Disc versus conical + 20%

Other Grades

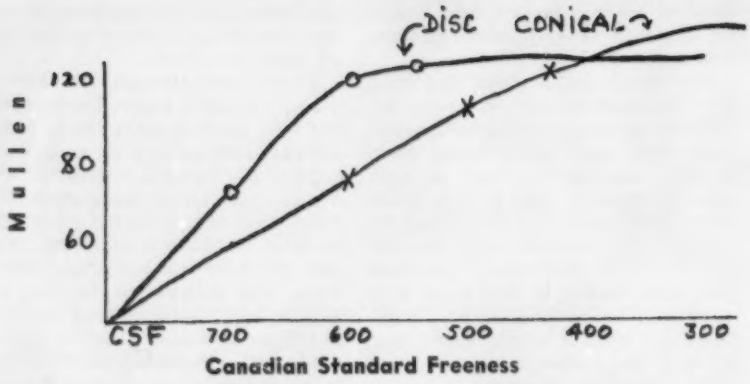
In the production of corrugating we did not see a single machine using only disc refiners. It should be noted that in this survey we examined two machines located in the same mill side by side of equal width and operating speeds—one with disc-conical refiner system and the other with conical refiner only. The variance in favor of the disc-conical system was 16 2/3 per cent. (See Table III)

TABLE III—CORRUGATING MEDIUM
11 Machines

	Daily Tons	HP/T/D
Disc-Conical Refiners	200	18.0
	410	9.05
	175	30.5
	Average	19.18
Conical Refiner alone	200	21.0
	500	10.18
	530	7.55
	400	15.4
	55	19.1
	100	14.25
	100	12.75
	Average	14.32

Variance:
Disc-conical versus conical — 25.3%

In the production of foodboard we observed most of the machines being operated on high tonnages where particular emphasis is placed on the production of half gallon bottom stock and 60 and 75 lb. cupstock. Only one system employed disc refiners and its production was limited to bottlestock. Therefore it is impossible to show a comparison of variance on the power consumption basis. The data in Table IV are included to explain the basic facts of life regarding the choice of type of refining system to manufacture food board.



SKETCH 7—MULLEN VERSUS FREENESS FOR DISC AND CONICAL REFINERS ON KRAFT STOCK.

TABLE IV—FOODBOARD

	Daily Tons	HP/T/D
Conical Refiner	330	9.7
	315	4.92
	400	9.0
	220	3.2
	170	7.65
	200	17.5
	190	12.15
	93	16.8
	90	15.0
	Average	10.7

In the production of publication papers the information in Table V was recorded.

TABLE V—PUBLICATION

		HP/D/T
Disc-Conical Refiner		20.0
		19.1
		27.4
	Average	22.2
Conical Refiner		5.4
		9.0
	Average	7.2

Variance:
Disc-conical versus conical — 67½%

In numerous other systems we found conical refiners used exclusively, as follows:

9 installations—Cigarette, bible, offset
2 installations—Kraft gumming
4 installations—Multiwall wrapping
5 installations—Cotton filter
10 installations—Twisting and toilet tissue
3 installations—Facial tissue
3 installations—Saturating sheets
16 installations—Folding grades (boxboard)
6 installations—Magazine

Summary of Mill Data

The pattern of application of the basic types of refiners appear to be very closely related to the ultimate physical characteristics required in the paper or board products being manufactured. Conversely, the raw materials and the methods of refining available in any specific mill determines the type of end products.

On the basis of actual field installation data, it is observed that both types of refiners have definite applications to obtain optimum operating economy and strength development characteristics of the raw materials to obtain the end product specifications. For example, note that conical refiners are indicated for the production of paper products requiring specific printability.

Additional detailed studies of actual operating experience, coupled with current developments of both the disc and conical types of refiners, will surely shed further light on the art of paper making and the mechanics of equipment engineering. Certainly, although we wish it were true, there seems to be no single refining engine that will act as a panacea to meet all the requirements of the paper maker.

Mills of the Future

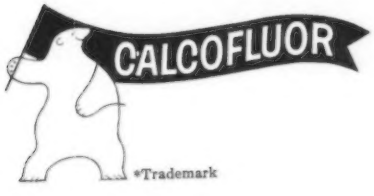
It has been observed from the data presented here based on tests in Southern mills, that the disc refiner is more efficient from a power input standpoint than a comparable size conical refiner on pulp where lignin and other impurities are incrusted on the surface of the fibers.

On high speed kraft machines it has been found that production records have been broken by the all disc refiner arrangement because the mullen curve plotted against freeness shows higher mullen at much higher freeness thus allowing faster water removal. (See the curves shown in Sketch 7.)

If we can apply this advantage to mill

EVEN **BLACK**-*AND-* WHITE *HAS MORE "COLOR"...*

when you specify papers treated with CALCOFLUOR* white!



*Trademark

You can't begin to appreciate how much CALCOFLUOR-treated paper adds to printed material without seeing an actual sample. Notice the extra whiteness of this insert! It's an eye-opening experience, isn't it!

From greeting cards to annual reports, CALCOFLUOR White adds amazing "drawing power." Papers with CALCOFLUOR offer the kind of brilliance and contrast that make color work really "sing."

If you want lifelike reproduction and greatly enhanced visual appeal in catalogs, letterheads, posters, magazines and other printed matter, make sure you specify "CALCOFLUOR-treated" papers. They're available in a broad range of grades and types—including coated stock, offset, vellum and bond—from America's leading papermakers! Ask your supplier for samples—today!

CALCOFLUOR

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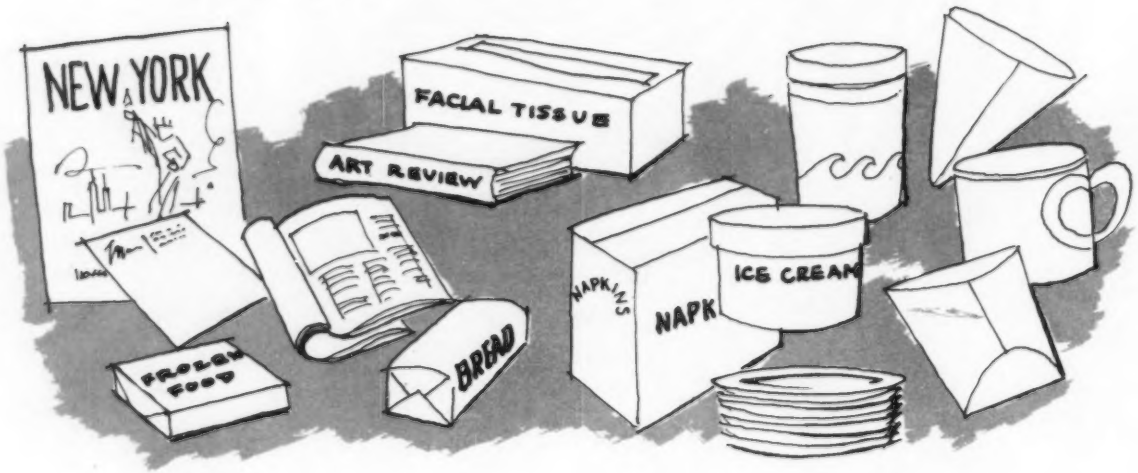
put

brilliant extra whiteness

in everything

from

printing to *paper cups!*



It's not only the printed page that benefits from CALCOFLUOR White!

Art directors, package designers and smart merchandisers are all discovering that people just naturally respond to the more beautiful, more brilliant CALCOFLUOR White papers at the *point of sale*. This added whiteness is truly like another dimension—a *marketing* dimension!

In paper plates, cups, napkins and tablecloths . . . in food wrappers . . . the super-whiteness of CALCOFLUOR-treated papers suggests super-cleanliness. CALCOFLUOR White makes paper handkerchiefs look cleaner, more attractive, too. And these are just a few of the uses for CALCOFLUOR White!

If printing papers or paper products are important to your business—you owe it to yourself to find out just how CALCOFLUOR-treated papers can improve your sales! It's easy to discover. Just write us.

PAPERMAKERS!

More people every day are discovering the extra appeal of CALCOFLUOR-treated papers. Why not get the facts on CALCOFLUOR White? Write us for more information.

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Symbol for Calco® Quality Dyes

design of the future it is entirely conceivable that two separate disc designs will be used in Southern kraft mills. One to produce the long well beaten fiber and the other to produce the fines to fill the surface intersticies so that the stocks will blend together into a sheet that will meet not only the bulk and density requirements but mullen, tensile and tear as well.

For folding grades of board perhaps a higher freeness stock will be used on cylinder machines. The same freeness differential may exist between the liner and the filler but the base freeness will be somewhat higher due to the special type of refining treatment possible with disc refiners. This treatment gives excellent defibering and good fibrillation at higher freeness and may permit increased production at higher machine speeds.

It is conceivable that disc refiners will become an important adjunct to cylinder board mills and that a combination disc and conical type system will produce better quality at less cost.

Others may believe as we do since we found experimentation with disc refiners going on in two mills making publication grades, the two patent coated linerboard mills, one cotton linter paper mill and two gypsum board mills. Results up to this time are not conclusive but certainly should prove interesting.

In closing, the immediate future should result in great strides being made in stock preparation. To our knowledge there are several concurrent developments being made on the equipment itself. Perhaps of greater importance and certainly of immediate interest is the fact that never before in the history of papermaking have there been so many qualified equipment suppliers available to paper mills who can come in and at your convenience help analyze, much as we have done here, the future course to be taken in the improvement of your respective grades.

Presented at the Delaware Valley Section of TAPPI meeting, November 21, 1958.

Paper Trade Journal | NEW LITERATURE

Automatic Reduced Voltage Starters

Carries descriptive copy on the theory and operation of low voltage starters from 50 to 1200 h.p. 600 volts. Also lists the advantages of autotransformer, closed transition connection, primary resistor and reactor, part winding and star-delta starters. Bulletin 14B8192. Allis-Chalmers Mfg. Co., Milwaukee 1, Wis.

Creative Craftsmanship in Steel

Describes coordinated engineering, fabrication and erection services offered. Also illustrates and describes CB&I-built storage and pressure vessels, Hortonclad and special alloy structures and the Horton Pickling Process. Booklet. Chicago Bridge & Iron Co., 2421 McCormick Bldg., Michigan Ave., Chicago 4, Ill.

Dexter Sheet Fed Casemaker

Provides illustrated sales copy on this high speed casemaker which can handle cases from 6½" x 8½" to 12½" x 18½" at speeds up to 3600 cases an hour. Folder. Dexter Co., Div. Miehle - Goss - Dexter, Inc., 2011 W. Hastings St., Chicago 8, Ill.

Eleventh Bolton Award Book

Contains ten prize-winning essays on "How I Can Help Relations Between My Company and My Community." John W. Bolton & Sons, Inc., Lawrence, Mass.

Storage Racks for Warehousing Economy

Describes the P-S 58 series of low cost storage racks which are built to customer specifications of heavy duty channel steel for use with pallets, skids or barrels for storage of light or heavy materials up to ceiling height. Folder. Palmer-Shile Co., 12663 Mansfield St., Detroit 27, Mich.

Wood Power Transmission Equipment

Covers complete line of sheaves, variable-pitch sheaves, V-belts, flat-belt pulleys, pillow blocks, flange units, take-up bearings, couplings and timing-belt drives. Bulletin 3101. T. B. Wood's Sons Co., Chambersburg, Pa.

Antara Chemicals

Contains separate sections devoted to sufactants, organic intermediates, acetylene derivatives, carbonyl iron powders, ethylene oxide and glycols and numerous specialty chemicals, including optical brighteners, ultra-violet light absorbers, etc. Also describes the composition, properties and uses of these products. Revised Catalog. Antara Chemicals, 435 Hudson St., New York 14, N. Y.

Big Machine Engineered Lorain 107

Describes this model which is a 7-8 ton truck-mounted crane, convertible to shovel, dragline, clamshell, hoe. This is a superstructure available for mounting on commercial carriers. 12 p. Catalog. Thew Shovel Co., Lorain, Ohio.

Bristol Charts for Special Requirements

Includes data on these charts for special requirements (including pre-printed photo charts for oscillographic recording). Also provides engineering information and chart samples. Bulletin Y1906. Bristol Co., Waterbury 20, Conn.

Cleveland Tramrail Engineering and Application Data

Contains detailed studies of track design, peening, and stresses. Also covers various types of carriers, cranes, tractors, track switches, buckets, grabs and electrification. Booklet 2008-N. Cleveland Tramrail Div., Cleveland Crane & Engineering Co., 1036 East 289th St., Wickliffe, Ohio.

The Penford Gums

Contains both technical and descriptive text with valuable information provided on the characteristics, properties and many uses of the various gums. Revised Catalog. Penick & Ford, Ltd., Inc., 750 3rd Ave., New York 17, N. Y.

This is Illinois Gear

Includes data and illustrations on the company's products, plant facilities, quality control facilities, as well as information on capacities, types, processes, materials, heat treatments, equipment, etc. Bulletin 26 IG. Illinois Gear & Machine Co. 2108 N. Natchez Ave., Chicago 35, Ill.

Warren Single Stage Double Suction Centrifugal Pumps

Feature their type DMB and DB ball bearing, horizontal split case, double suction centrifugal pumps for white water, fan pump service, and general water service. Also includes detailed specifications, sectional view, selection table and outline dimensions. Bulletin 251. Warren Pumps, Inc., Warren, Mass.

Cleveland Folders by Dexter

Describes complete line of folders which are available in various sizes to handle sheets from 3 x 4 inches to 44 x 64 inches. Also includes specifications and fold plans, along with descriptions of the type of work for which each is best suited. Brochure. Dexter Co., Div. of Miehle-Goss-Dexter, Inc., 2011 W. Hasting St., Chicago 8, Ill.

Electrically Heated Trough Liner Plates

Gives complete data, specifications and description of these liner plates which quickly convert conventional feeders to efficient in-transit feeding and drying units. Data Sheet. Syntron Co., 587 Lexington Ave., Homer City, Pa.

Glowing Picture of Paperboard Future Presented to Company Executives

National Paperboard Assn's 26th annual meeting in mid-November received enthusiastic reports on fall production and on the outlook for 1959 and beyond.

Enthusiastic optimism for both the short and long range outlook was the keynote of the 26th annual meeting of the National Paperboard Ass'n., held at the Waldorf-Astoria hotel in New York on November 11 and 12. This was supported in three ways, first by the report of production and demand increases since early summer, second an optimistic economic forecast of future demand for paperboard and thirdly a speech discussing future opportunities and reporting outstanding new developments by board mills which can lead to greater use. A number of board company leaders were heard however to unofficially express concern that present prosperity might lead to a round of expansions and over-capacity.

President's Address

"The true measure of success of the paperboard industry now, is not solely the service rendered to customers nor how well our financial statements look, but our contribution to the economic and moral strength of the nation is of paramount importance," John R. Kennedy, president of the association, told the 26th Annual Meeting.

The paperboard industry will play a vital part in the continued progress of our country. To do so, paperboard mills must promote increased efficiency, higher productivity, sounder merchandising programs; the development of new products, new markets, new opportunities and new customers for our products, Mr. Kennedy declared.

"We have reached industrial maturity and our patterns of thought should be in keeping with the importance of the industry and our responsibility to the national economy" he concluded.

John R. Kennedy
Re-elected President National Paperboard Association

Production Continues at New Highs

Production of paperboard during the eight weeks between the Labor Day week and the end of October averaged 310,700 tons per week, Warren F. Wescott, assistant statistician, National Paperboard Association, reported. This is most significant, he said, since prior to this time the industry had produced over 300,000 tons per week only five times. With these increased runs total production for 1958 is only .8 per cent below 1957. Orders for paperboard received in October 1958 averaged 314,100 tons per week, which is 19,600 tons over the previous record established in 1955.

Capacity Survey

A. A. Newburg, statistician of the association, reported on the latest paperboard capacity survey through 1960. It appears that present capacity, plus increases now in progress, should take care of a normal growth in demand during the next few years. This normal growth averages five per cent per year. In addition to these committed capacity increases, the companies also have longer range plans which could be pushed forward to readily take care of any unusual increases in demand. This tonnage was called by Mr. Newberg "additional potential capacity increase" and he presented figures for the additional tonnage which could be brought in from this in 1959 and 1960.

From Mr. Newburg's figures, it appears that there will be ample capacity available, or potential for all grades to handle any possible "peace time" demand that can develop in the next three years.

Praises Paperboard Progress

"Future opportunities for paperboard packaging lie in better appearance, improved function and greater economy," Lloyd Stauffer, editor of "Modern Packaging," said in his speech.

He praised the paperboard industry for its forward thinking management and phenominal growth which has resulted in a per capita increase in the use of folding cartons from 245 in 1925 to 676 paperboard packages for each man, woman and child in 1957. Calling for increased research, Mr. Stouffer reported on several outstanding new developments by paperboard mills, both in boxboard used for folding cartons and containerboard, which is made into corrugated shipping containers.

"The record shows that you gentlemen of the paperboard industry have been outstandingly alert and progressive, in meeting and anticipating these

needs. With continued close attention —with a willingness to move, as you have in the past, with the shifting trends—I am confident that you will continue to grow, and to reach, perhaps, your greatest year in 1959" he concluded.

Forecasting for Next Year

Demand for paperboard during 1959 is expected to be about 5 per cent above the 1958 level, reported Peter Hoguet, president, The Econometric Institute. Production will be higher, about 7 per cent over 1958. Containerboard will probably show one of the largest gains in 1959, Mr. Hoguet said, These production rises will be attributable to the expected continued improvement in the overall economy. Consumer purchasing power is likely to move steadily upward through the remainder of this year and throughout 1959. Some increases in prices at both the consumer and wholesale level are likely but these will most likely be much less than income gains. Consequently real consumer purchasing power will continue a rising trend throughout 1959. All of these factors tend to raise the demand for paperboard for all types of packaging. Mr. Hoguet declared.

Urged to Participate in Politics

"Political Responsibilities cannot be attended to by proxy" Donald J. Hardenbrook, chairman of the board of American Creosoting Corp. and vice-president and director of Union Bag-Camp Paper Corp., told the meeting.

In urging American business to become more active in politics, Mr. Hardenbrook pointed out that many executives believe that by belonging to their trade associatioin, the NAM or the Chamber of Commerce, that they have effectively shifted their political responsibilities. "While those business organizations can and do perform effective services in their legislative fields, they are no substitute for an aroused public opinion from back home," he declared.

Partisanship should not be a factor in businessmen assuming political participation as there are radicals and conservatives in both parties, Mr. Hardenbrook observed. "It is the ideological character of the candidate and the philosophy which motivates him which should be the basis of our evaluation," he said.

New Directors

The following paperboard mill executives were elected members of the Board of Directors.

W. J. Alford, Jr., Continental Paper Co.; B. P. Altick, Fibreboard Paper Products; J. N. Andrews, The Ohio Boxboard Co.; A. Rodney Boren, The Mead Corp.; F. E. Brown, Manchester Board & Paper; George M. Burrus, United Board & Carton; Alexander Calder, Jr., Union Bag-Camp Paper; W.D.P. Carey, Central Fibre Products; J. B. Cowie, Scott Paper—H & W Div.; Anthony Desiderio, Whippany Paper Board Co., R. C. Doane, International Paper Co.; George E. Dyke, Continental Can Co.; W. M. Finley, Tennessee Paper Mills; E. J. Gardner, Jr., Diamond Gardner Corp.; W. S. Goodspeed, American Box Board Co.; Wiley L. Jennings, West Virginia Pulp & Paper; J. R. Kennedy, Federal Paper Board Co.; Thomas Kieffer, Kieffer Paper Mills; Hugh C. Laughlin, Owens-Illinois Glass Co.; Roger L. Main, St. Joe Paper Company; H. W. Morgan, Weyerhaeuser Timber Co.; C. H. Morian, Jr., East Texas Pulp & Paper; J. C. Mulholland, Crossett Paper Mills; Sture G. Olsson, Chesapeake Corp. of Va.; W. I. Osborne, Jr., Corneil Paperboard Products; Arthur E. Rozin, Loroco Industries, Inc.; P. A. Schilling, Waldorf Paper Products; L. H. Schoenhofen, Container Corp.; Henry D. Schmidt, Schmidt & Ault Paper Co.; M. W. Swaim, Alton Box Board Co.; G. J. Ticoulat, Crown Zellerbach Corp.; H. L. Wollenberg, Longview Fibre Company; Charles L. Wood, River Raisin Paper Co.

T. N. Bland and Sidney Frohman also serve as Directors, as past Presidents of the Association.

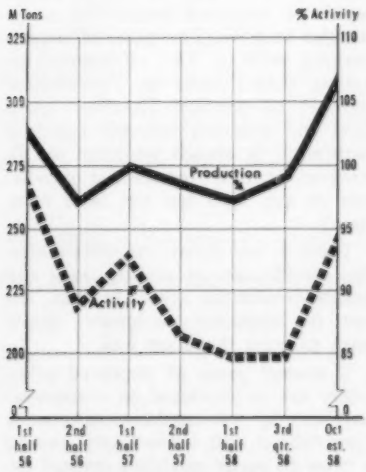
Officers Re-elected

J. R. Kennedy, president of Federal Paperboard Co., was re-elected president of the National Paperboard Association. Federal Paperboard also has mills in New Haven, Versailles, Montville, Connecticut; Whitehall, Maryland; Reading, Pennsylvania; Steubenville, Ohio and Morris, Illinois.

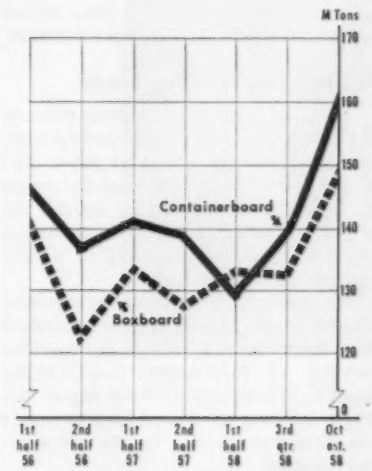
Mr. Kennedy, a graduate of New York University, became associated with Federal as assistant to the president after a varied career on Wall Street and with the copper industry. He became president in 1952.

H. L. Wollenberg, president, Longview Fibre Co., Longview, Washington was re-elected a vice-president of the Association.

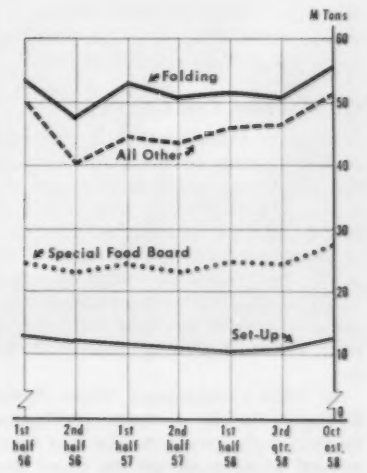
Sture G. Olsson, president, the Chesapeake Corp. of Virginia, was re-elected a vice-president of the Association. Following service with the U.S. Navy during World War II he entered the Chesapeake Corp. of Virginia as plant engineer in 1946. In 1951 he was named vice-president in charge of manufacturing, from which position he advanced to executive vice-president in 1952 and was elected president in October 1952.



TOTAL PAPERBOARD PRODUCTION and ACTIVITY



PRODUCTION Containerboard-Boxboard



PRODUCTION Boxboard By Grades

What is the Direction of On-Machine Coating of Printing Papers?

One of the largest manufactures of coated papers discusses recent developments in on-the-machine coating methods

Harold Murtfeldt

Vice-president—Enamel Paper Sales
Consolidated Water Power and Paper Co.

Much publicity has been given to a method of producing enamel printing paper by a combination of roll coating and trailing blade coating on the paper machine in one continuous operation with installation of such equipment scheduled for completion next year.

How did this process develop? Does it look promising? What does it mean to the printer? Are unprecedented quality papers to be expected at lower cost? Should inventories be held to a minimum in anticipation of this new process?

This special report attempts to answer these questions.

It has not been our policy to announce changes in quality or manufacturing process until such changes have been satisfactorily proven in commercial operation. But as there has been some advance publicity and possible misunderstanding, it seemed advisable to present this advance information.

As the result of extended research and development a process such as that discussed in this report is presently under construction at Consolidated.

On-Machine Roll Coating

Prior to Consolidated's introduction of roll coating on the paper machine the only way to make coated papers was in a slow multiple step process on narrow equipment operated independently of the paper machine. Because of the extra steps, restricted widths and slow speed of this off-the-machine process, coated papers were priced much higher than uncoated printing papers of that day.

In 1934 Consolidated Water Power & Paper Co. in a major production breakthrough, produced the first commercial paper made on the paper machine at paper machine speeds in one continuous operation. This on-the-machine process, invented by Peter J. Massey a practicing printer and brought to commercial perfection by Consolidated, applies by means of a series of coating rolls a special coating composition simultaneously to both sides of the full width paper web as it is made on the paper machine. It is in effect the principle of offset printing applied to papermaking.

For the first time in 1934 coated papers were made available at the price of uncoated papers. As Consolidated gained knowledge and experience, enamel papers of continually improved quality were produced on its machines until what amounted to a revolution in coated papers could be called complete.

Today, true coated papers in a full complement of basis weights and qualities for the finest 4-color illustration to the simplest black and white halftones are made on the paper machine. As a result, coated papers of the highest quality and value are available at a substantial cost savings over coated papers produced off the paper machine.

On-Machine Trailing Blade

In the trailing blade coating process, a quantity of liquid coating composition is applied to the uncoated paper surface and the excess removed by means of a flexible blade bearing against the paper. The use of a flexible blade makes it possible to apply coating in a very smooth application.

To date the commercial application of the trailing blade process on paper has been limited to off-the-machine coating of lightweight publication grades. The quality of these papers has been inferior to coated papers made on-the-paper machine by the roll coating process.

From a mechanical standpoint the trailing blade coater has greater utility than other off-the-machine coating methods in three respects:

1. It can take full width reels as they come from the paper machine.

2. Both sides of the paper can be coated in one continuous operation.

3. The unit can be operated at high speeds.

Research has found that, under controlled laboratory conditions, trailing blade coating as the second application in a double coating operation may make possible an improved printing surface.

Combining Roll and Trailing Blade

The speed, width and continuous coating application of the trailing blade coater make it mechanically possible to install a unit directly on the paper machine in tandem with a Consolidated roll coater. This is the most efficient use of trailing blade, as it eliminates all extra manufacturing steps.

The result might be double coated papers of improved printability at no increase in price. Two years of experimenting with a 72″ off-the-machine trailing blade coater at Consolidated points in this direction. The theory looks good and extended research seems to confirm it. It should be clear to all, however, that no commercial installation of this type has yet been completed.

There is no reason to believe that this combination of coating units will reduce production costs. In fact, the cost of additional equipment would seem to point the other way.

If enamel paper of improved printability can be produced on a commercial basis by this combination process, Consolidated will immediately expand it to its 10 paper machines devoted exclusively to the manufacture of coated printing papers.

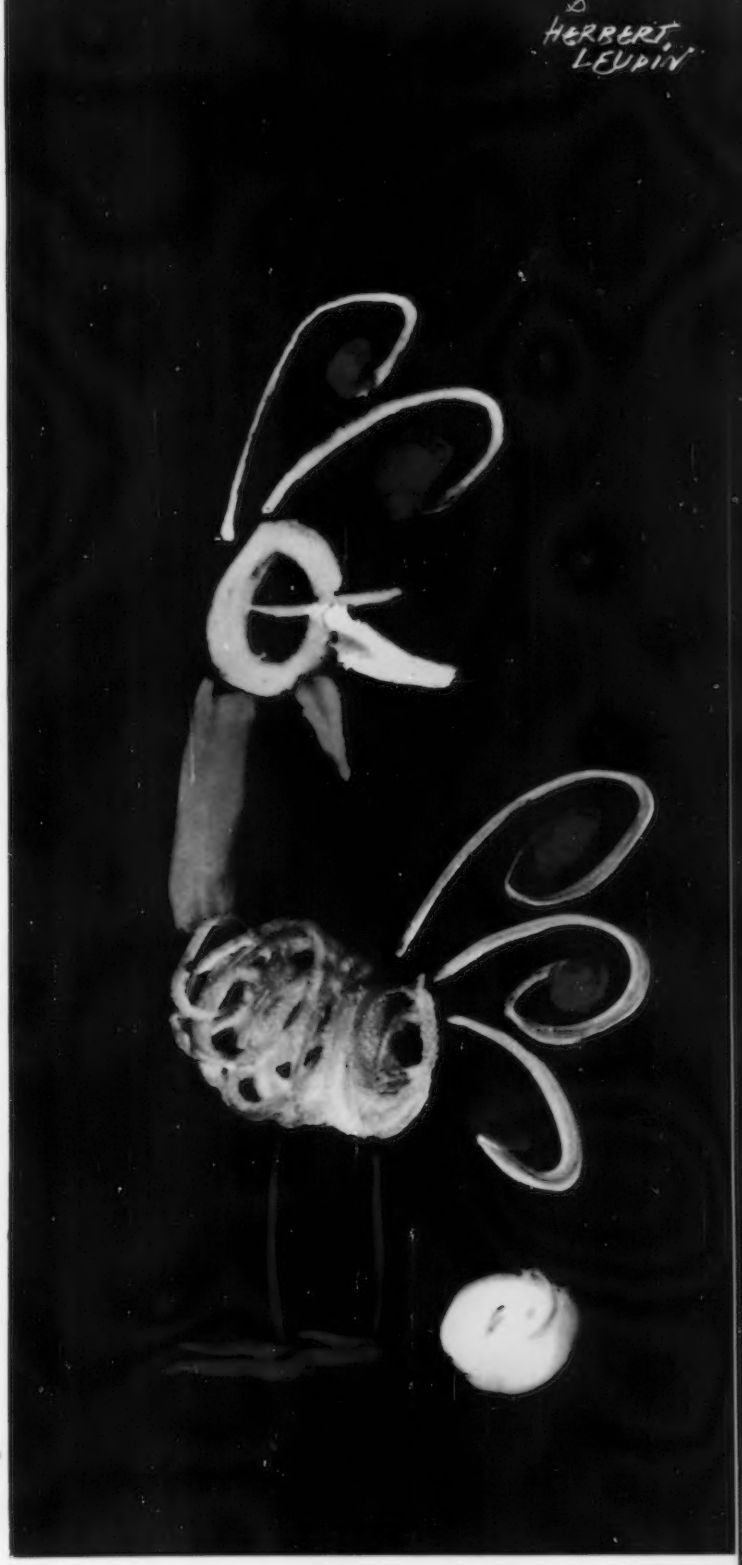
TOUGH CASE

Ever said, "Our problem is different"? When SANDOZ technicians recently read of 141 miles of waxed paper, printed as an ad in a mid-west newspaper, they recalled an interesting instance of stock contaminated by wax from paper cups. A residue of wax kept showing up as greasy rings around any specks of color in the board.

For that customer, SANDOZ was able to recommend a dye formula which colored the furnish uniformly. Thereafter, wax that evaded the initial dewaxing process came through the paper board process with a colorful but completely submerged personality.

Have you a "tough case"? Let SANDOZ help you figure it out. Just call or write: SANDOZ, INC., 61-63 Van Dam Street, New York 13, New York. ALgonquin 5-1700

District Offices: Charlotte, Cincinnati, Fair Lawn, N. J., Hudson, Mass., Los Angeles, Philadelphia.



SANDOZ

THINKS AHEAD WITH PAPER

SANDOZ

Random Thoughts on Wire Marking

Edwin J. Cole

The wire mark on paper is due to the sheet being pushed or pulled into the fourdrinier wire, so that when it is pulled off the impression remains in the sheet. The impression is reduced by pressing, the amount of reduction being dependent on press felt quality. Some manufacturers claim that a twinver or inclined press will eliminate wire mark, although this has never been proved. Finer wires of course give a less objectionable wire mark than coarser ones.

Formation Vital Factor

Wire mark can be critically affected by the manner in which the jet impinges on the wire from the slice. If there is either a pronounced degree of pressure formation, or a breast roll discharge then the initial layer of the sheet, which in certain cases may amount to twenty per cent of the total weight, is forced into the wire and the likelyhood of a pronounced wire mark is thereby increased.

This condition is often present in the case of old machines running at the highest speeds where a breast roll discharge is necessary to obtain the drainage essential for the speed and formation. It is, therefore, usual to find that machines in this category produce paper with a pronounced wire mark.

This leads to rule one for avoiding wire mark:

"Lay the sheet on the wire evenly and smoothly using the forming board to delay drainage and avoiding a breast roll discharge."

Wire mark will be more obvious when the formation is not even. Then, spots, bubbles, etc. show the most wire mark since more water, or air, flows through these spots. Clots or lumps forming high spots on the sheet will not allow any smoothing work and the presses and calenders cannot get down into the low spots to iron out the wire mark.

Effect of Vacuum

The sheet is pulled into the wire on the flat boxes and thus the greater the vacuum at the boxes the more the wire mark. As is well known, therefore, the vacuum on the flat boxes should be run as low as possible and this can only be done by taking full advantage of the water removal powers of the table roll section. Thus rule two is:

"Take full advantage of the water removal power of the table roll section and maintain the lowest practical vacuum at the flat boxes."

The flat box cover design should be such as to give the maximum suction area possible.

The sheet is also pulled into the wire over the couch but since a high couch vacuum is essential for machine operation this cannot be reduced. Thus the sheet should be as dry as possible before the couch and embedded in the wire as little as possible.

Pick-up May Aggravate

In the case of machines fitted with vacuum pick up, the pressure of the pick-up roll on the wire can cause a wire mark of some intensity. This is usually due to failure to regulate the speed between wire and pick-up felt. If the pick-up felt speed is too slow, then there is a sort of micro creping and the pick-up felt and roll has to be pushed into the wire to get pick-up. The pick-up roll may be faster than the wire in which case the paper is stretched but wire mark is not likely to result, though the paper character may be deleteriously affected.

The pressure on the wire by the pick-up roll can be reduced by using a denser felt for pick-up but the denser this felt is the more difficulty is one liable to run into in machine operation.

Similarly, wire mark can be reduced by the using of a felt of finer quality. Such felts, however, often have a less effective water removing capacity and are, therefore, not as easy for the machine operators; the felt life is lower and thus the running in period occupies a disproportionate amount of the total felt life.

Calendering Can Help

Calendering is one way to remove some wire mark, however, if the calendering is too hard, then a low caliper, low mullen sheet results and gives some show through in the pressroom. With too high a finish, there is a lack of pull up on the printing presses with some danger of offset printing.

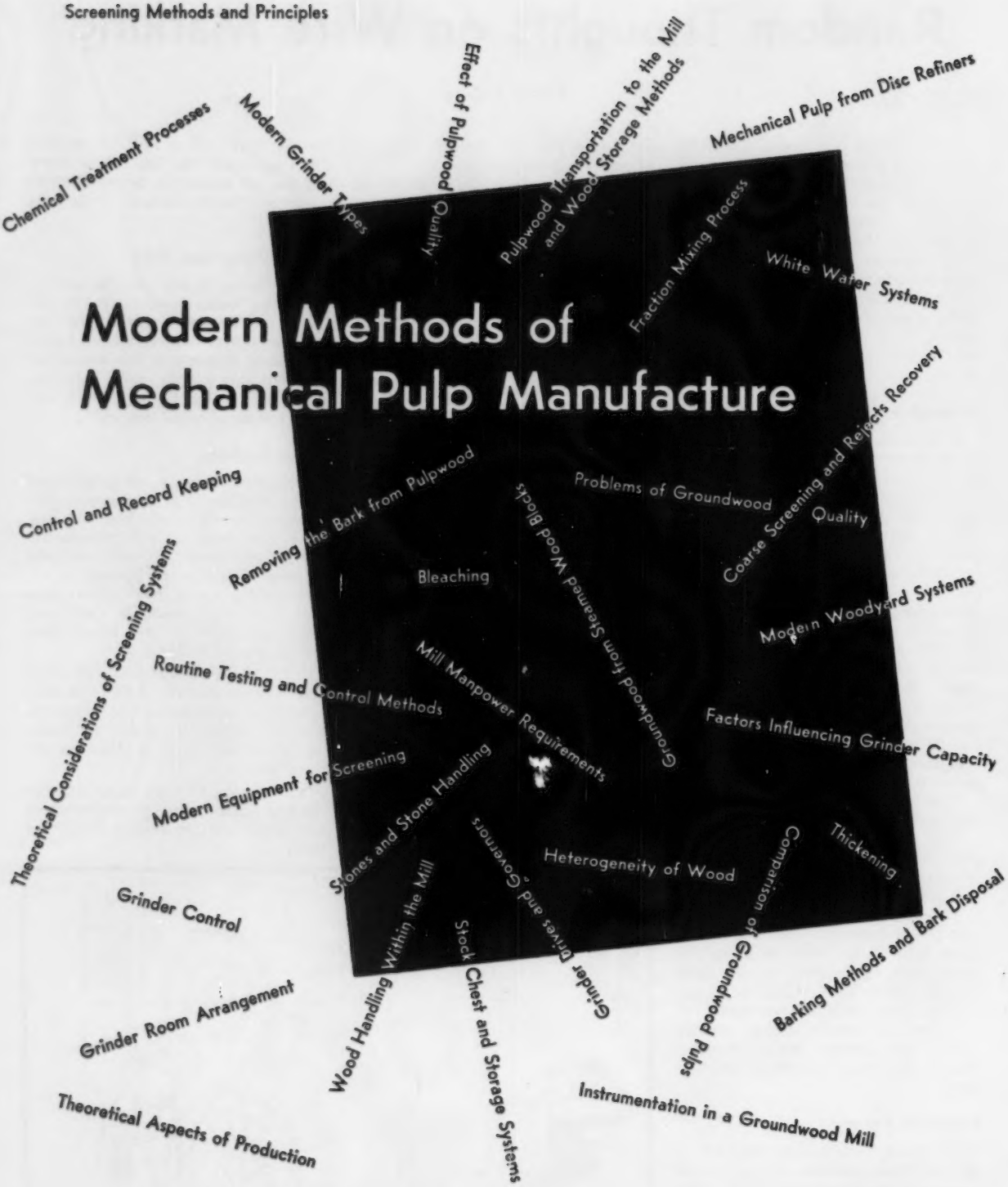
Other Factors

Some theories attributed at least part of the wire mark to the suction produced by the table rolls, however, machines have been run with micarta top T deflectors, instead of table rolls and the wire mark was still present.

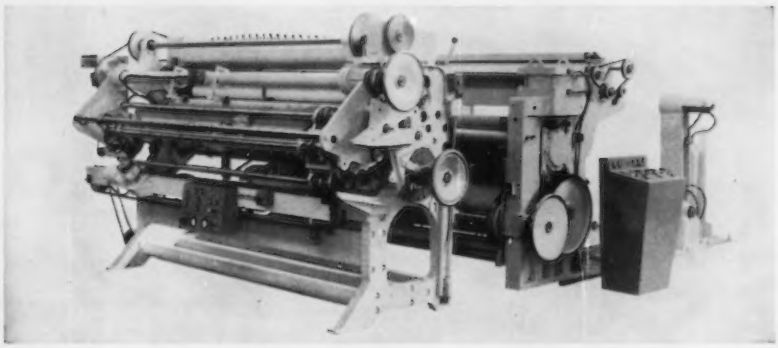
Increasing speeds have given more wire mark. Some machines which give a bad wire mark at 1900 f.p.m. show little if any at 1600 f.p.m.

Each of the machine variables that have been noted above have to be tried to attempt to minimize wire mark one at a time, starting at the slice and forming board and working down to the press section.

The changes that are made must be checked against actual measurement of wire mark and the printability of the sheet.


Screening Methods and Principles
Chemical Treatment Processes
Modern Grinder Types
Effect of Pulpwood Quality
Pulpwood Transportation to the Mill and Wood Storage Methods
Mechanical Pulp from Disc Refiners
Modern Methods of Mechanical Pulp Manufacture
Fraction Mixing Process
White Water Systems
Control and Record Keeping
Removing the Bark from Pulpwood
Problems of Groundwood
Groundwood from Steamed Wood Blocks
Coarse Screening and Rejects Recovery
Quality
Bleaching
Theoretical Considerations of Screening Systems
Routine Testing and Control Methods
Mill Manpower Requirements
Modern Woodyard Systems
Modern Equipment for Screening
Factors Influencing Grinder Capacity
Stones and Stone Handling
Heterogeneity of Wood
Thickening
Grinder Control
Wood Handling Within the Mill
Stock Chest and Storage Systems
Grinder Drives and Governors
Comparison of Groundwood Pulps
Barking Methods and Bark Disposal
Grinder Room Arrangement
Theoretical Aspects of Production
Instrumentation in a Groundwood Mill
Economic Importance, Main Properties, and Uses of Groundwood

. . . written by K. H. Klemm, this new book in 241 pages comprehensively covers all aspects of groundwood pulp production. Price: $5.00 from Lockwood Trade Journal Company, 49 West 45th Street, New York 36, New York



Rewinder Features Continuous Operation

A new automatic rewinder has been added to the line of converting machinery built by Paper Converting Machine Co., Green Bay, Wisconsin. The new rewinder, Model 2481, is a 90″ machine featuring continuous operation at speeds over 1000 feet per minute. This rewinder transfers the web automatically for each set of rolls while running full speed.

One operator can easily operate two of these rewinders because the mandrels remain in the machine and an automatic core loader eliminates manual labor. The rewinder has a new shear-cut perforating unit. An accurate roll count is made with a clean cut-off, and a variable count can be arranged for different size rolls.

The embossing unit has air-loaded 20″ diameter embossing rolls with micrometer adjustments for accurate control of the nip pressure. This micrometer adjustment gives positive control for maintaining the same pressure when it is necessary to separate the rolls and then bring them back to their original operating position.

The unwind stand is a shaftless belt-driven type that takes 60″ diameter jumbo rolls. It is designed with an automatic, constant tension dancer roll.

Automatic Moisture Control System Improved

A new instrument panel for its Pres-Ten-Trol automatic moisture control system has just been announced by Stickle Steam Specialty Co., 2215 Valley Ave., Indianapolis 18, Ind.

The new panel incorporates red and green lights to indicate whether the system is operating on tension control or pressure control, and an "Auto Shift" switch that permits the operator to change instantly from automaticto manual control of steam. During normal operation the green light is on. In case of a break, an electric eye control turns on the red light, and automatically switches the system from tension control to pressure control and maintains a preset level. The operator may then use the "Auto Shift" to shut off steam entirely for manual operation.

The panel contains all controls and instruments for regulating, indicating and recording steam pressure in the dryers and moisture variation in the sheet. A 24-hour chart gives a permanent record of each run.

According to the company, the system automatically maintains the exact moisture content desired, within ½ of 1 per cent, by regulating the steam flow to the dryers. Operation is described in Bulletin 360-C, available from Stickle.

New Pipeline Aftercooler For Air Compressor Service

A new line of pipeline aftercoolers designed to cover the range of conditions encountered in industrial air compressor service has been introduced by American-Standard, Ross Heat Exchanger Division.

Designated Type A-100, this series is fully standardized to eliminate the high engineering costs and long delays involved in custom fabrication. Features include steel shell construction, corrosion resistance, removable tube bundle, packed floating head, and nonmetallic baffles. A new moisture separator employs centrifugal force to remove entrainment from the line.

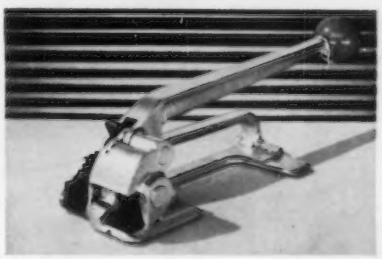
The "counter current flow" design permits the coldest (incoming) water to serve the coldest (outgoing) air for maximum heat transfer efficiency. All sizes are rated for either 10° or 15° temperature approach.

Ross pipeline aftercoolers are offered in 54 models with capacities specified for operating pressures up to 125 psig for single and two-stage compression. Specially engineered units can also be fabricated to meet unusual cooling requirements.

Complete information can be obtained by requesting Bulletin 302.6K1 from American-Standard, Ross Heat Exchanger Division, Buffalo 5, N. Y.

New Versatile Tightener For Steel Strapping

A versatile, unlimited take-up steel strapping tool is now being marketed by Stanley Steel Strapping, division of The Stanley Works, New Britain, Conn. Light-weight and sturdy, the new manually-operated "O" tightener has been engineered to require fewer strokes, and to operate with exceptional ease. Used to apply steel strapping to packages of varying sizes, shapes and weights, it may be operated in any position and will strap in any direction —using the right or left hand.



Applying seals to the rear of the tensioning wheel cuts overlap to minimum required for maximum joint security. The tightening action is more positive because there are two holding pawls instead of one on the tensioning wheel, and the tool is removed quickly by simply returning the tightening lever to its down position and sliding the tool from the strapping.

Two models are available, the "OL," (light duty) and "OM" (medium duty) for light and medium duty strapplications. Model Nos. "OL3," "OL4" and "OL5" take strap sizes ⅜″, ½″ and ⅝″ respectively. Model Nos. "OM5" and "OM6" take ⅝″ and ¾″ respectively.

JAGENBERG

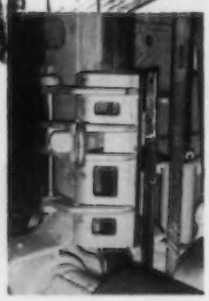
PNEUMATIC REWINDER

Rewind shaft moves precisely between hardened steel panels without any lateral play.

FRONT GUIDES OPEN

FRONT GUIDES CLOSED

Shaft ends are provided with ball bearings.



Some of the other features:

- **Shear or score cut**
- **Rapid knife setting system**
- **Built-in roll lowering device**
- **All rollers are driven**

Priced considerably below any comparable product available.

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SHEET CUTTERS

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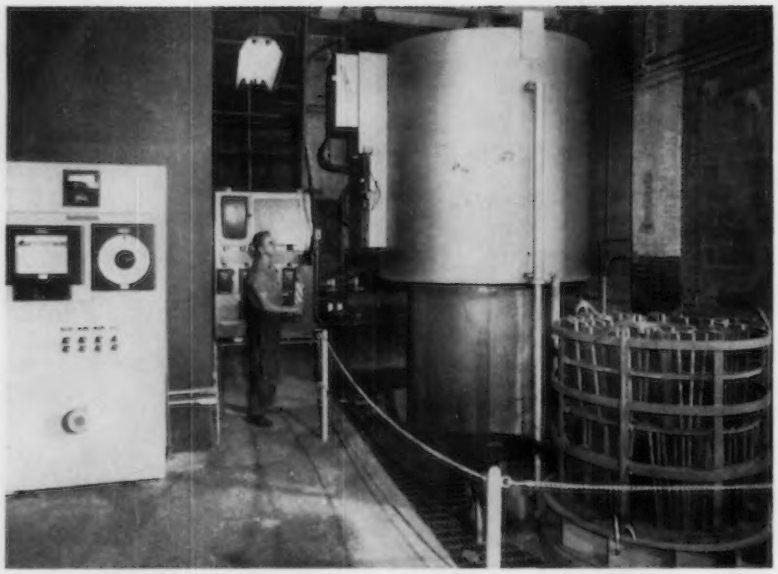

New automatically controlled electric heat treating installation at John W. Bolton & Sons Inc., showing furnace being lowered over the hood. Within the hood is a specially designed wire basket for holding knives like the one shown at right resting on the hearth.

John W. Bolton & Sons, Inc., Lawrence, Mass., has recently installed an automatic, electrically controlled, bell type tempering furnace for stress releaving, annealing, tempering and drawing machine knives up to 48 inches in length.

Controls for the new unit were designed specifically for Bolton's requirements. Heat is held to accurate pre-set temperatures and is continuously monitored by recording instrumentation. The cooling cycle is similarly controlled to give the knives a slow, uniform return to room temperature.

By such precision control over the time and temperatures of the complete heating and cooling cycles, and by maintaining detailed data on each knife load, absolute uniformity and duplication of heat treating can be guaranteed. The new facility increases many times the number of knives that can be tempered simultaneously.

Bolton's new electric furnace is unique in its operation compared to conventional types. The furnace heats two chambers alternately, each with over 100,000 cubic inch capacity. Knives are placed in specially designed wire baskets containing spacer units to prevent any contact between them. This method assures free circulation of air surrounding all knives.

After the wire baskets are loaded with knives, they are placed on the hearth. A hood is lowered over the racks providing total enclosure. At this point the furnace is lowered over the hood. Air is re-circulated inside the hood by a fan located in the hearth and temperature of the load is recorded and controlled continuously.

Monsanto Chemical Co. today announced plans to establish production facilities at its Seattle, Wash., plant for Mersize, a fortified rosin size used by paper manufacturers to give water resistance to paper and paper board.

Construction already has begun on the new unit which is scheduled for operation early in 1959. It will supplement the company's existing production of Mersize at Baxley, Ga., and Montreal, Canada. Bulk storage facilities for the product now are operated at Seattle.

Lloyd D. Shand, manager of paper chemicals sales for Monsanto's Organic Chemicals Division, said that the company plans to ship rosin to the new Seattle plant for processing into paste Mersize for western paper mills.

Harry W. Gordon

Worthington Corp. mechanical power transmission sales department at Oil City, Pa. has appointed Harry W. Gordon supervisor of the variable speed drive section. Formerly mechanical power transmission distribution representative in the corporation's Philadelphia district office, Mr. Gordon replaces R. C. Angell who resigned.

Prior to joining Worthington Corp. in 1956, Mr. Gordon had been associated with American Pulley Co. for about six years as district manager of their New York and Seattle offices.

J. D. G. Thomson

Northeastern Paper Sales, Inc. has opened a New England office to serve its pulp customers in the area. It is located at 40 Benedict Terrace, Longmeadow, Mass.

The office is headed by Mr. J. D. G. Thomson, who has been transferred from the company's Canadian parent organization, Anglo Paper Products, Ltd. Prior to joining Anglo Paper Products, Mr. Thomson was with the Canadian rayon textile industry in a sales capacity.

Warwick Wax Co., Inc., subsidiary of Sun Chemical Corp., has announced that the Charles Tennant & Co. (Canada) Ltd., newly established Pacific Division with offices and warehouse at 1396 Richard Street, Vancouver, B.C., will offer a full line of Warwick Wax products. Tennant has been the exclusive source for Warwick Wax in Canada for over fifteen years.

Previously in charge of wax sales at Tennant's Toronto headquarters, Theodore H. Schuessler will manage the Vancouver branch office and will service the growing paper and timber industries of British Columbia with products manufactured and distributed by the Tennant group.

Solvay Process Division, Allied Chemical Corp. announced the appointment of John W. Priesing as West Coast sales representative.

In his new post, Mr. Priesing will be responsible for developing sales of Solvay products in the Pacific Coast states.

Mr. Priesing received a Masters Degree in Business Administration from Harvard Business School. He joined the Comptroller's department of Allied Chemical in 1956 as a Financial Analyst. In December of that year Mr. Priesing transferred to Solvay Process and was assigned to the Detroit, Mich. sales branch. He is now located at Allied Chemical's Consolidated Sales Office, 235 Montgomery Street, San Francisco, Calif.

Penick & Ford. Frank Ware is sales representative in Michigan-Wisconsin area..

Mr. Ware was formerly a sales representative for Industrial Sales, Chemurgy Division of the Glidden Co., The Brown Co. of Berlin, N. H., and the Semet Solvay Petrochemical Division of Allied Chemical Corp.

Frank Ware

Kalamazoo Glazed Tile Tanks

Designed for the Paper Industry

6 Reasons why you should give us a call on your next job

Kalamazoo's steel reinforced glazed tile tanks are designed and erected by experts. If you have a specialized building problem it will pay you early dividends to call us now.

TILE TANK DIVISION

Kalamazoo TANK & SILO CO. KALAMAZOO MICHIGAN

Shake out your Wrinkles

Strange as it may seem, your rewinder very likely needs a Ross Midwest Hydroscillator to "shake out" the wrinkles and keep hard and soft spots from forming in your rolls—often the basis for customer complaints and price concessions.

This compact little rewinder assistant readily goes on to the rewinder shaft and is hydraulically operated. Strokes of ½" to 3¾" as required. Oscillation speed 0 to 15 per minute. Two sizes—one with 11,000 lb. thrust. Large one with 25,000 lb. thrust. Small. Rugged. Guaranteed.

Troubled with Defective Mill Rolls?
If So... You Need A HYDROSCILLATOR

ROSS MIDWEST FULTON CORP.
DAYTON, OHIO

A Unit of
J. O. Ross Engineering Division
MIDLAND-ROSS CORP.

Representatives
James Brinkley, Seattle; Clark & Vicario, North Tarrytown, N. Y.; Ross Engineering of Canada Limited, Montreal—Fredericton—Toronto—Port Arthur—Vancouver

Huyck Felt Co., recently conducted its eleventh felt workshop. Graduates, seated clockwise at table at left are: F. E. Ferrige, Thilmany Pulp and Paper; R. Traxler, Marinette Paper Co., New York; D. Finnegan, Great Northern Paper; W. Bowen, Scott Paper Co.; C. Rothwell, Rogers Corp.; L. R. Giersch, Crown Zellerbach; J. W. Gray, Jr., Downingtown Paper; W. Clark, International Paper Co.; S. D. Hodge, Bloomer Brothers. Around the righthand table (starting at front, inside) are: S. Backer, M. I. T.; W. Hilton, Downingtown Paper; A. Wazlak, Marcalus Manufacturing; J. Stefonik, Rhinelander; W. Davis, West Virginia Pulp and Paper; J. W. Mengel, Eastman Kodak; F. Kichefski, Rhinelander Paper; R. Cormier, Gardiner Paper Mills; L. Orbaker, Bloomer Bros. H. Dirzuweit, Huyck's senior research engineer, directed the discussion.

OBITUARIES

Edward C. Reid, 58, president of American Writing Paper Corp., died in Granby, Massachusetts, on November 11. Mr. Reid joined the corporation in 1937, becoming vice-president in 1941. He assumed the position of president in 1951.

Rupert B. Daniels, 70, treasurer and superintendent of the L. L. Brown Paper Co. Mr. Daniels joined the staff of the Brown company in 1910 and held the position of superintendent for most of his career. In 1938 he was made treasurer.

Frank P. Silver, 65, died November 1, 1958. He was the first manager of the Bucksport, Maine paper mill and for nine years was manager of the paper mill at Corner Brook, Newfoundland. Following that he was manager of the Price Brothers mill at Riverbend, Que., for 10 years. He retired five and a half years ago.

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R. S. Hammond

Whiting Corp., Harvey, Ill., Robert S. Hammond, vice president in charge of Chicago office, retired on October 31 after forty years of service with the company. Whiting is a leading manufacturer of foundry, railroad, materials handling, and chemical processing equipment.

A graduate of the University of Michigan, Mr. Hammond began his active business career in 1911 as a special apprentice with American Steel Foundry at Granite City, Ill. After holding a number of other positions with that company, including assistant to the sales manager and sales agent, he joined Whiting Corp. in 1919 as Pittsburgh district manager. He became Chicago district manager in 1921 and was named sales manager and vice president at Whiting's Harvey headquarters in 1930. He has been Chicago District Manager since 1936.

Edmund C. Paca

Mr. Paca, recently appointed sales engineer of southwestern territory for **Albany Felt Co.,** N. Y.

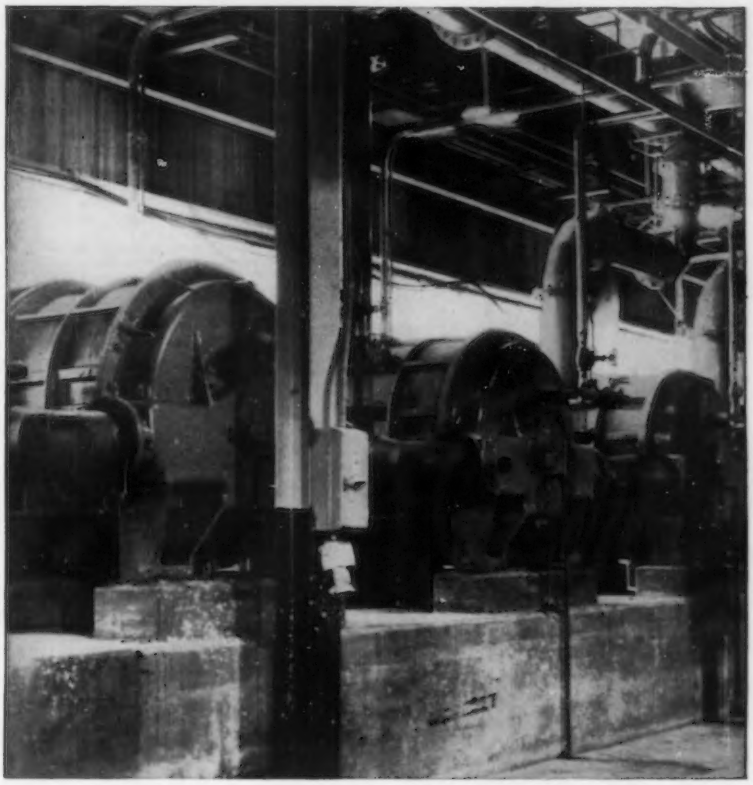
Wm. W. Moore

Mr. Moore is vice-president for sales and director for **Research-Cottrell, Inc.**

Shawinigan Resins Corp., Eugene F. Cartwright has joined the New York sales office.

Mr. Cartwright, who formerly was senior salesman, chemical and metallurgical division of General Electric Co., received a B.A. degree in chemistry from McGill University (Montreal, P.Q.) in 1950.

What, actually, do Vacuum Pumps on paper machines handle?



Paper mill engineers know that it is actually a mixture of air and water vapor, but the custom of rating vacuum pumps in terms of air capacity alone causes this important fact to be frequently overlooked.

The presence of this water vapor causes a considerable reduction of the effective air handling capacity of any vacuum pump except the Nash. In the Nash Vacuum Pump the bulk of this water vapor is effectively condensed, due to the Nash operating principle. The air handling capacity of the Nash is therefore not reduced.

That is one of the reasons why Nash Vacuum Pumps are standard in over a thousand leading Paper Mills.

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graders and packers of waste paper

PIONEER PAPER STOCK COMPANY

Figures of the Week

PAPER PRODUCTION RATIO REPORT—American Paper & Pulp Assn. Figures

(Production as per cent of normal capacity)

COMPARATIVE WEEKLY SUMMARIES

1958	Oct. 11 91.9	Oct. 18 92.1	Oct. 25 91.9	Nov. 1 91.1r	Nov. 8 88.3
1957	Oct. 12 91.0	Oct. 19 92.2	Oct. 26 94.4	Nov. 2 94.6	Nov. 9 91.1

r Revised.

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	86.9	89.5	89.5	88.1	86.4‡	86.2‡	76.0‡	89.8‡	86.7‡	91.4‡	—	—	—
1957	94.2	97.0	97.1	94.0	94.6	93.3	75.6	90.7	86.0	93.0	90.7	81.5	90.9

‡ Preliminary.

COMPARATIVE YEARLY SUMMARIES

	1951	1952	1953	1954	1955	1956	1957	1958
Year to Date	99.7	90.6	93.7	92.0	95.2	100.1	91.2	86.6
Year Average	98.0	88.6	92.3	91.6	94.0	97.9	90.9	

All of the above data is based on tonnage reported to American Paper and Pulp Association, Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available.

PAPERBOARD OPERATING RATIOS†—National Paperboard Assn. Figures

COMPARATIVE WEEKLY SUMMARIES

1958	Oct. 11 95	Oct. 18 95	Oct. 25 94	Nov. 1 95	Nov. 8 93
1957	Oct. 12 97	Oct. 19 98	Oct. 26 97	Nov. 2 94	Nov. 9 94

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year Avg.
1958	80	86	88	84	84	86	76	93	90	95	—	—	—
1957	91	94	94	92	93	91	72	94	91	97	92	79	90

† *Percents of operation based on "Inch-Hours" reported on a 6-day basis.*

SUMMARY OF PAPERBOARD STATISTICS—National Paperboard Assn. Figures

ITEM	THIS WEEK ENDING Nov. 8, 1958	LAST WEEK ENDING Nov. 1, 1958	CUMULATIVE TO DATE Jan. 1 to Nov. 8, 1958
% Activity	93%	95%	87%
TOTAL	311,196	317,807	12,153,146
Liner	110,370	113,843	4,082,535
Corrugating Material	46,918	50,084	1,827,934
Chip & Filler Board	5,676	4,852	215,446
Total Containerboard	162,964	168,779	6,125,915
Folding	54,531	55,896	2,317,002
Set-Up	13,495	12,335	484,207
Special Food Board	25,966	27,755	1,127,905
Other	54,240	53,042	2,098,117
Total Boxboard	148,232	149,028	6,027,231
TOTAL ORDERS			
Received	345,836	324,112	
Unfilled End of Week	460,078	427,573	

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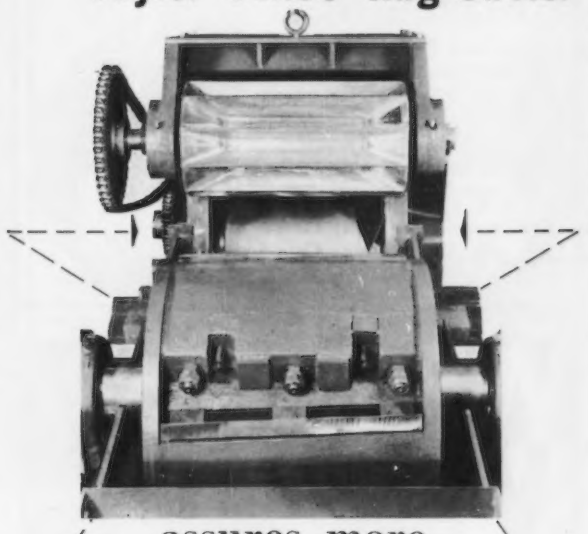
PAPER MILL DESIGN PROCESS ENGINEERING POWER PLANTS

STRUCTURAL AND ARCHITECTURAL DESIGN

REPORTS APPRAISALS ESTIMATES AND SURVEYS

This Taylor-Stiles Rag Cutter



assures more uniform cutting-and is PRACTICALLY JAM-PROOF

Taylor-Stiles Rag Cutters now have several new features that make them practically jam-proof and, if a jam does occur, that speed up cleaning. These features mean real savings for you by sharply reducing down time.

A single large diameter feed roll extended through the sides of the feed trough and mounted on rigidly connected pivoted arms holds the stock firmly and produces uniform cutting. End plates on the single feed roll overcome any tendency of the rags to disperse outwardly. The space between the cutting element of the frame has been widened as a further measure to prevent jamming.

If, for any reason, a jam should occur, the feed roll can be lifted up out of the way without removing any parts, since no springs are used. The photograph above shows the feed roll lifted up by crane. The crane hook is visible in the top of the picture. This makes the end of the feed apron, the bed knife and the cutting assembly instantly accessible for cleaning.

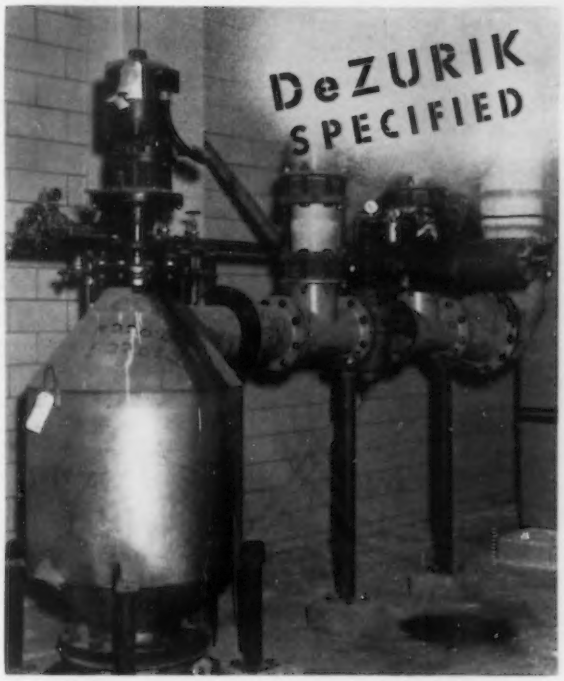
Several paper mills which have modernized with the new 500 series Cutters report fewer jams and greatly reduced downtime, if a jam should occur.

It will pay you to learn more about the improved Taylor-Stiles Rag Cutters.

Write today for our 4-page, 2-color Bulletin 214, illustrating and describing these improved machines.

TAYLOR, STILES & COMPANY

9 Bridge Street Riegelsville, New Jersey



in mill after mill!

DeZurik Consistency Regulators *remain* the top choice of mills everywhere! Over 3000 installations have proved beyond doubt that DeZurik Regulators offer more to begin with and continue to deliver top performance year after year after year!

ACCURATE

DeZurik Regulators are *guaranteed* to hold stock consistency within limits of plus or minus .1%. Many of them, installed directly ahead of paper machines, are holding consistencies to plus or minus .02%!

DEPENDABLE

Spattering stock cannot affect the performance of DeZurik Regulators. They do not need constant attention, they set easily, hold precisely and provide a 24-hour chart-record of incoming and outgoing consistencies.

DeZurik Consistency Regulators are available in three basic types to adapt to a wide variety of installations such as regulating stock after high density pulp storage chests, basis weight control, stock metering systems and refining systems.

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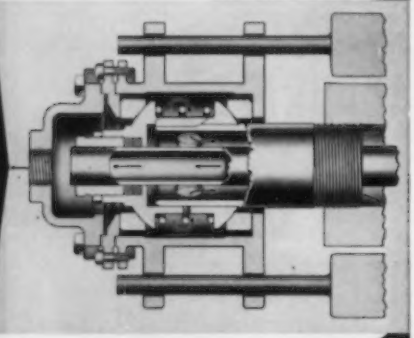
Type LN Johnson ROTARY PRESSURE Joints "First in the paper industry"



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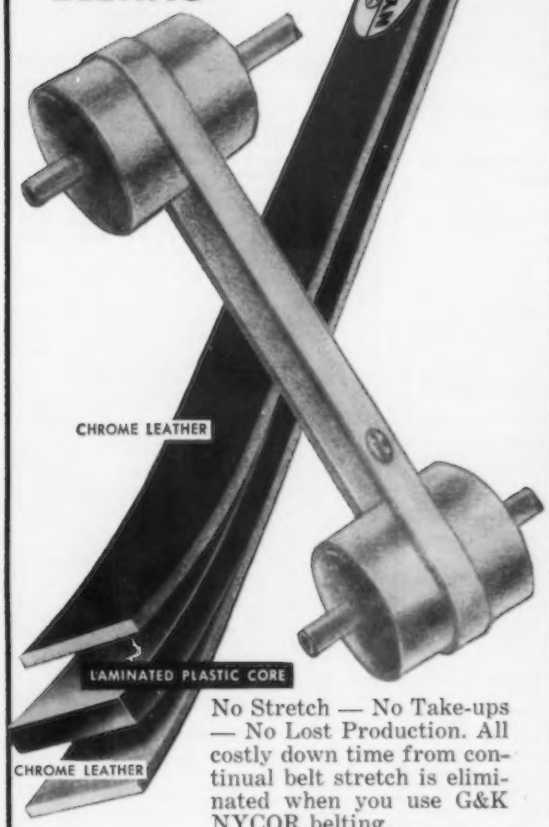

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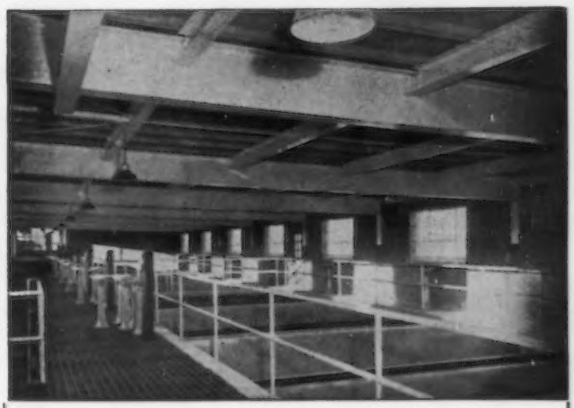

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Your inquiry with full resumé will receive immediate, confidential attention. Write Keith A. Rasmussen, Technical Employment Supervisor, The Mead Corporation, Chillicothe, Ohio. D-1

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Wanted by manufacturer of paper and film bag machinery and printing presses.

Located in pleasant New Jersey community.

Degree not necessary—only the ability and practical background for independent design of converting machinery.

Excellent opportunity for capable man. Salary open.

Please send resume of experience. Box 58-13 care Paper Trade Journal.
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Paper Mill experience required. Familiar with drawings; ability to organize work. Good personality. An excellent growth opportunity. Over 35 years of age. Mill located in South Eastern Pennsylvania. Address Box 58-292 care Paper Trade Journal. D-8

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Young recent graduate in science or engineering with a few years experience in pulp and paper manufacture for interesting job in New York City office. Replies treated in greatest confidence. Please write Box 58-267 Paper Trade Journal.
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1—54" 1-color Rotogravure Press
1—49" 1-color Rotogravure Press
2—41½" 4-color Hudson Sharp Flexo Presses
1—40" 4-color Hudson Sharp Flexo, Roll to Sheets
1—40" 3-color Kohlback Flexo Press
2—36" 4 & 5 color P. W. Wolverine Hydro Presses
2—36" 2 color Champlain Gravure Presses
1—36" 5 color Koenig & Bauer German Rotogravure Press
1—24" 5 color Kidder Celloprinter
1—24" 3-color Rotogravure Press
1—24" 4-Color Kidder Celloprinter
1—17½" 3-color Chambon Press
2—12 x 12 New Era Presses

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1—30" 5-color Gregg Flexo Press
1—16" 2-color Potdevin.

POWER PAPER CUTTERS

Seybolds: 1—44" late model Seybold Model P4460 New 1952
Precision: 40", 50", 57" & 64"; 10Z: 40", 57" & 65"; 20th Century: 45", 54" & 60"; Dayton (6Z): 35", 40" & 84"; Holyoke: 65"; Sheridan: 36" new model, 55"; Oswegos: 38" & 44" & 34", 54" Heavy Duty; Lawson: 52" Auto Space & 52" Standard.

CAMACHINES

1—72"—10-04 8 Shear Cut.
1—72"—10-5 rebuilt and guaranteed, with water cooled brake and anti-friction bearing. Speed 2000 F.P.m.
1—66" & 2—52" 9-5.
1—62" 26-2A with 100 score cutting units
1—62"—40—1—AF
1—60" Cameron Type 42, for small rolls.
1—52" Type 6 Rebuilt and guaranteed.
1—52", & 1—42", Model 24-7.
1—42" Type 9-5-A Roller Bearing 1500 fpm.
1—42" Cameron 26-7M Duplex
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OTHER SLITTERS

1—82" Langston Type—B
1—40" Langston Type A.
1—50" New Type "C" Fales Slitter
1—45" Ruf Duplex Winder.
1—42" Kidder Merchant Model
1—38" and 1—40" Beck Razor Blade.
30" Fales Model—B Slitter and Rewinder
2—24" 1—30", 1—36" & 1—40" Kidder S.L. Shear cut

MISCELLANEOUS MACHINES

1—72" Hudson Sharp Wax Paper Rewinder
1—46" Reverse Roll Coater
1—48" Hot Melt Coated and Laminator
1—40" and 1—48" Asphalt Laminators.
1—60" Hot Melt Coaters & laminators
1—90" Duplex Hamblet, Layboy and Back Stands
10—Hamblet Sheeters 32", 42", 45", 50", 62", 68", 72", 84", 90" and 104"
1—30" Peters Sheeter Model UD.
1—45" Model CSHD Beck Sheeter with layboy
3—Standard Brightwood automatic Box Machines
1—40 x 30 Roll Fed Thrissell English cutting and creasing press
4—Schultz continuous roll winders. Two—12", One 18" and 1—48".
3—Polyette Polyethylene tubular bag machines
2—Model B-10 Bagprint machines
1—Potdevin Model 224 Garment Bag Machine, 2 color printing, large range.
Die Presses: 1—60" x 14" Seeley. 1—50" x 33" Sheridan, 2—37" x 18" Sheridans and 1—44" x 22" Sheridan, 2—Hobbs Mfg. Co. 44" x 30" & 44" x 38"
1—9-roll Holyoke Super Calender with drive
3—Waldron Gummed Paper Breakers 50", 56" & 66"
1—Hayssen 4-roll Toilet Roll Wrapper
1—54" x 26" Sheridan, Model 9A. Embossing Press, roll feed.
1—2 Web, 1—3 Web Paper Converting Co.'s. Jr. Dispenser Napkin Machines
1—30" Double Reverse Roll Coater
1—MD Knowlton Core Winder
1—50" Hudson Sharp Embosser-tinter.
1—48" Unicraft Embosser
2—81" Dietz Facial Toilet perforators with Lawtomatic Model A Jr. Wrappers N-24

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BEATERS
2—1500 lb. rag beaters, Valley Iron, bandless rolls, 54″ x 48″, cast iron tubs

CALENDER STACKS
1—3 roll 84″ calender stack.
1—4 roll 72″ Calender Stack. (Extra heavy duty).
1—5 roll 82″ face.
1—5 roll 86″.
1—7 roll, 84″ face.

CHIPPERS
1—96″ Murray 4 knife Chipper—anti-friction bearings.
1—84″ 10 knife Carthage Chipper. Anti-friction bearings.
24—Chipper Knives 15⅞ x 8¾, 2 slot.

CREPING DRYER
1—48″ diameter x 120″ face, with frames, bearings, doctor blade and drive.

CRUSHERS & HAMMERMILLS
1—Murray Chip Crusher.
1—Williams Hammermill

CYLINDER MOLDS
2—42″ diameter x 106″ face
8—36″ diameter x 94″ face, hollow shafts, Very good condition.
1—30″ diameter x 72″ face.
1—30″ diameter x 92″ face.
1—36″ diameter x 84″ face
2—36″ dia. x 54″ face.
3—36″ diameter x 90″ face, 18″ diameter couch rolls.
1—60″ dia. x 170″ face.

DIGESTERS
1—Biggs 12′ 6″. (Globe)

DISINTEGRATOR
1—Shartle 8″ disintegrator (new) with 125 horsepower induction motor. (Totally enclosed)

DRIVES
1—Rice-Barton hypoid enclosed drive, 4 to 1 ratio.
1—#6 Reeves vertical—anti friction bearings, totally enclosed.
1—Sandy Hill right angle 50 H.P. (4.75 to 1).
1—Jones 21 H.P., ratio 10 to 1 (enclosed angle drive)
1—#4 Reeves Drive
2—Waterbury Hydraulic Variable speed line shaft drives (from 40 to 100 H.P.)
1—Beloit hypoid enclosed drive 60 h.p. 5 to 1 ratio.
1—5 H.P. Reliance Drive, complete with starting equipment, like new.

DRYERS
1—28″ diameter x 84″ face
2—30″ diameter x 40″ face with bearings
2—30″ diameter x 48″ face with bearings.
4—48″ dia. x 52″ face with frames, gears, bearings
1—36″ diameter x 44″ face
3—36″ diameter x 76″ face.
5—36″ diameter x 84″ face, anti friction bearings and gears.
22—28″ diameter x 40″ face with frames, gears and felt rolls
1—16″ diameter x 54″ face (steel)
6—48″ diameter x 130″ face.
2—Cooling Drums, bronze 36″ x 128″, with frames, gears & necessary rolls to make up the unit. (After dryers)

EMBOSSING CALENDERS
1—43″ 3-Roll Embossing Calender.
1—62″ 2 roll Embosser.

EXTRACTOR ROLLS
1—Extractor roll, 26″ diameter x 104″ face
1—Rice Barton & Fales, Extractor Roll, 26″ diameter x 104″ face

FELT ROLLS
50—Brass Felt Rolls, with Brass Journals, 72″ face x 5″ dia.

FLAT SCREENS
1—8 Plate "Packer"
1—12 Plate "Packer"
1—16 Plate "Packer" late type roller shoes.

HOGS
2—Mitts Merrill Type 15 C.F.

JORDANS
1—Noble & Wood Mammoth
1—Noble & Wood Monarch, Type D.

LABORATORY EQUIPMENT
1—Bauer-McNett Fibre Classifiner, monel tanks, complete with copper screen plates.
1—Basis weight scale
1—16″ diameter x 24″ face Laboratory High Pressure Dryer
1—Press Roll 6″ diameter 24″ Face, steam jacketted
1—2′ Shartle Hydrapulper
2—8″ x 8″ Valley Sheet dryers
1—12″ x 12″ Valley Sheet dryer
1—6″ diameter Hydraulic Press
1—25 lb. Valley Laboratory Beater, with washer.
1—Experimental Digester (High Pressure)
1—15 lb. E. D. Jones Beater
3—Jonsson Test Screens
1—Sutherland Refiner
1—Schopper-Riegler Freeness Tester
1—8″ x 8″ Williams Sheet Mold
2—8″ x 8″ Valley Hydraulic Presses
1—Williams Smoothness and Formation Tester
1—6″ Mayer Coater, all rolls and pans bronze and steam heated. Used for brush, knife, reverse roll or dip coating, also waxing & plastic coating.
1—Clark Softness & Stiffness Tester
1—20″ Dilts Wet Machine

LAMINATING MACHINES
2—84″ Asphalt laminators.

MISCELLANEOUS
1—#1 Miami Selectrap

MOTORS
1—100 H.P. Westinghouse Motor, variable speed, 585 r.p.m.

PACKAGING MACHINE
1—Morpac Packaging Machine (Details on request).

PRESS ROLLS
2—Chilled iron, chrome plated 9″ x 72″
1—Chilled iron, chrome plated 12″ x 100″
1—Chilled iron, chrome plated 10″ x 74″
8—sets (1 rubber, 1 chrome steel) 74″ face x 15″ dia., complete with bearings.

PULPERS
4—Dyno-Pulpers

PUMP
1—Morris-10,000 g.p.m. 25 ft. head (all bronze)

REELS
1—86″ 2 bowl reel.
1—84″ 3 bowl revolving reel.
1—100″ Rice Barton 2 bowl Reel, heavy duty.
1—123″ 3 bowl Revolving Reel
1—134″ 2 drum
1—72″ Downingtown Reel, 2 bowl.

REFINERS
1—Dilts Classifiner, practically new
1—Rice Barton Dynofiner, details on request.
1—Dilts, Hydrafiner, stainless steel filling, anti-friction bearings, excellent condition, including 125 h.p. motor
1—12″ Wiener Refiner, with 200 h.p. motor

REGULATORS
1—Bird Consistency Regulator
1—Trimbey Consistency Regulator

ROLLS
Felt, Table, Press, Breast, Couch, etc. Various sizes and types. (Bronze, Rubber, Iron, etc.)

ROTARY SCREENS
1—#1A Bird, copper vat.
2—APMEW Rotary Pulp Screens.

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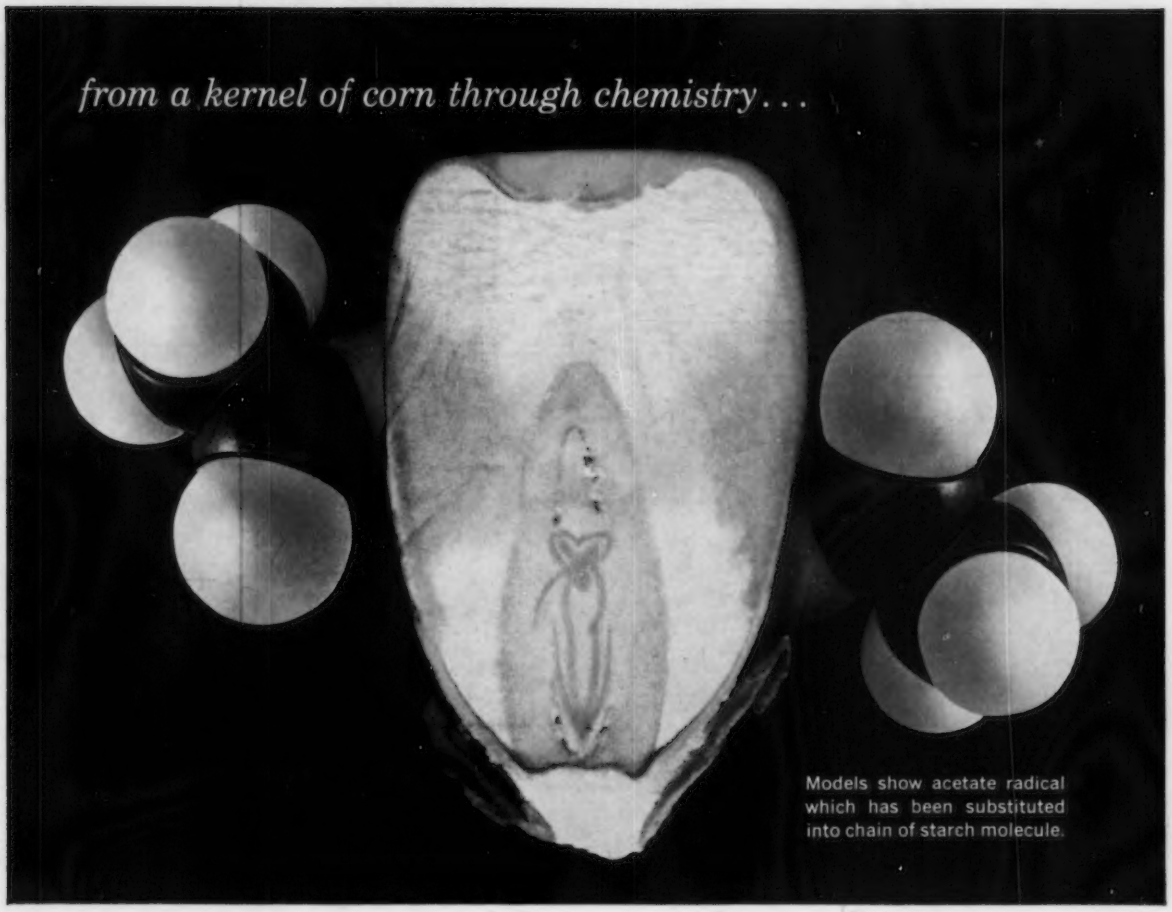
from a kernel of corn through chemistry . . .
Models show acetate radical which has been substituted into chain of starch molecule.

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